Geography

Handwritten Note

for

Competitive Exams

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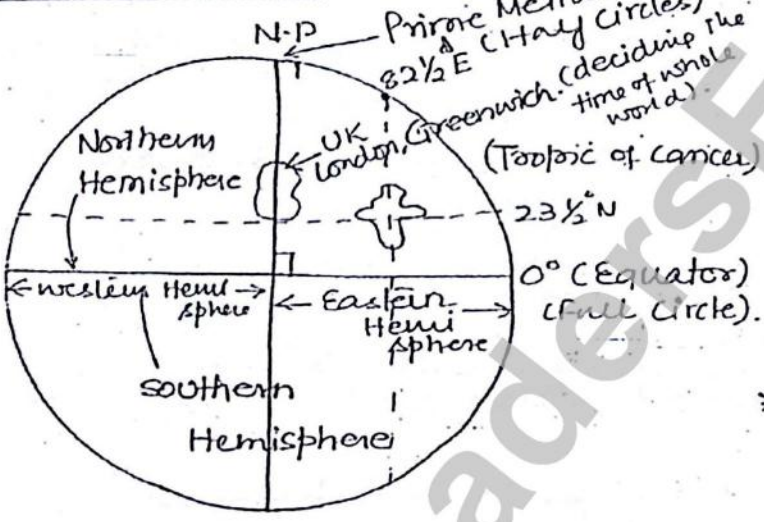
* Geography (G.S)
  - xxx → Indian Geography.
  - → Physical Geography.
  - → World Geography.

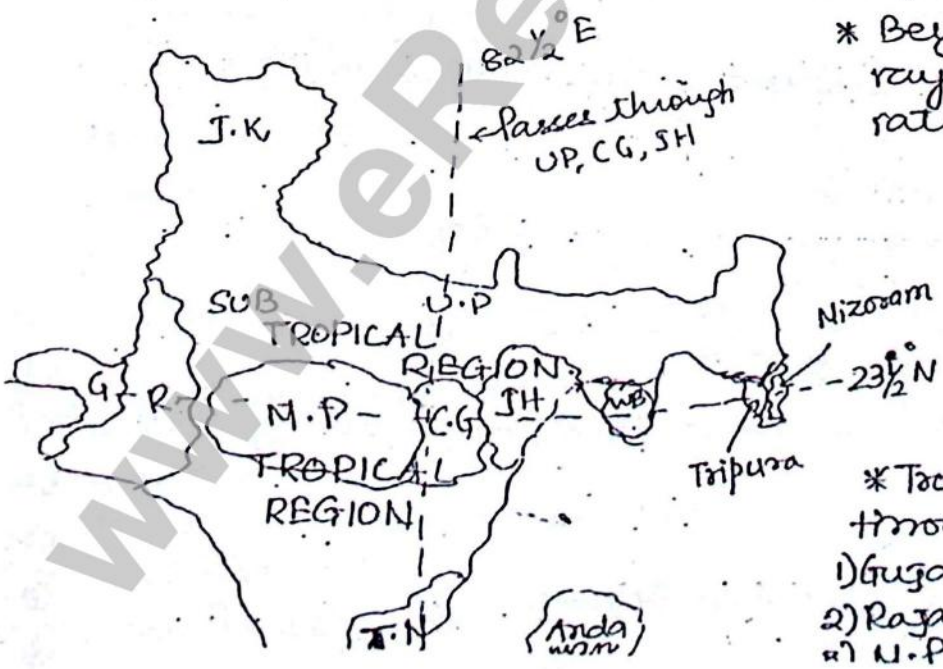
* INDIAN GEOGRAPHY:

* location of India
* Size
* our Neighbour.

* location of India:



* India is a tropical country and located in the Northern Hemisphere.
* 23½°N line divides the India into 2 equal halves called as the TROPIC OF CANCER
* Upto the Tropic of Cancer the Sun rays are vertical during some days of the year
* Beyond or above the Tropic of Cancer, the sun rays are never vertically rather slant in nature.



* Shadow of length decreases when one moves downward from the Tropic of Cancer & vice versa.
* Tropic of Cancer passes through:
  1) Gujarat
  2) Rajasthan
  3) M.P
  5) Jharkhand
  6) Tripura.
  7) WB
  8) Mizoram.

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Gujarat → Ahmedabad
→ Gandhinagar

Rajasthan → Udaipur
→ BANSWADA (Closest among all).

M.P → Bhopal, Ujjain
→ Jabalpur, Sanchi (Closest among all)
— etc —.

Chattisgarh → Bilaspur
→ Ambikapur (Closest among all).

Jharkhand → Ranchi (Closest among all). (Closest of above)

W.B → Durgapur (Steel Town).

Tripura → Agartala.

Mizoram → Aizawl, SARCHIP (highest literacy rate in India ≈ 99%).

On the 82½° E line :

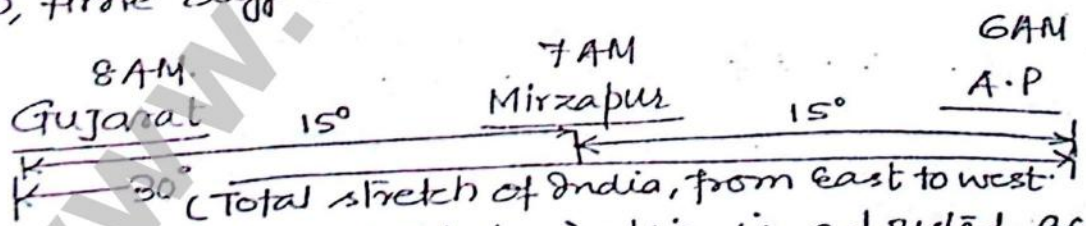
1) UP → Allahabad, Mirzapur ← decides the time of whole India (IST).

360° — 24 hrs.

15° → 1 hrs.

difference of degree b/w Gujarat & Arunachal Pradesh is 30°

So, time diff is 2 hrs.



But the time of whole India is adjusted according to the time of Mirzapur.

Southern most state is T.N.

Southern most UT is Andaman & Nicobar Island.

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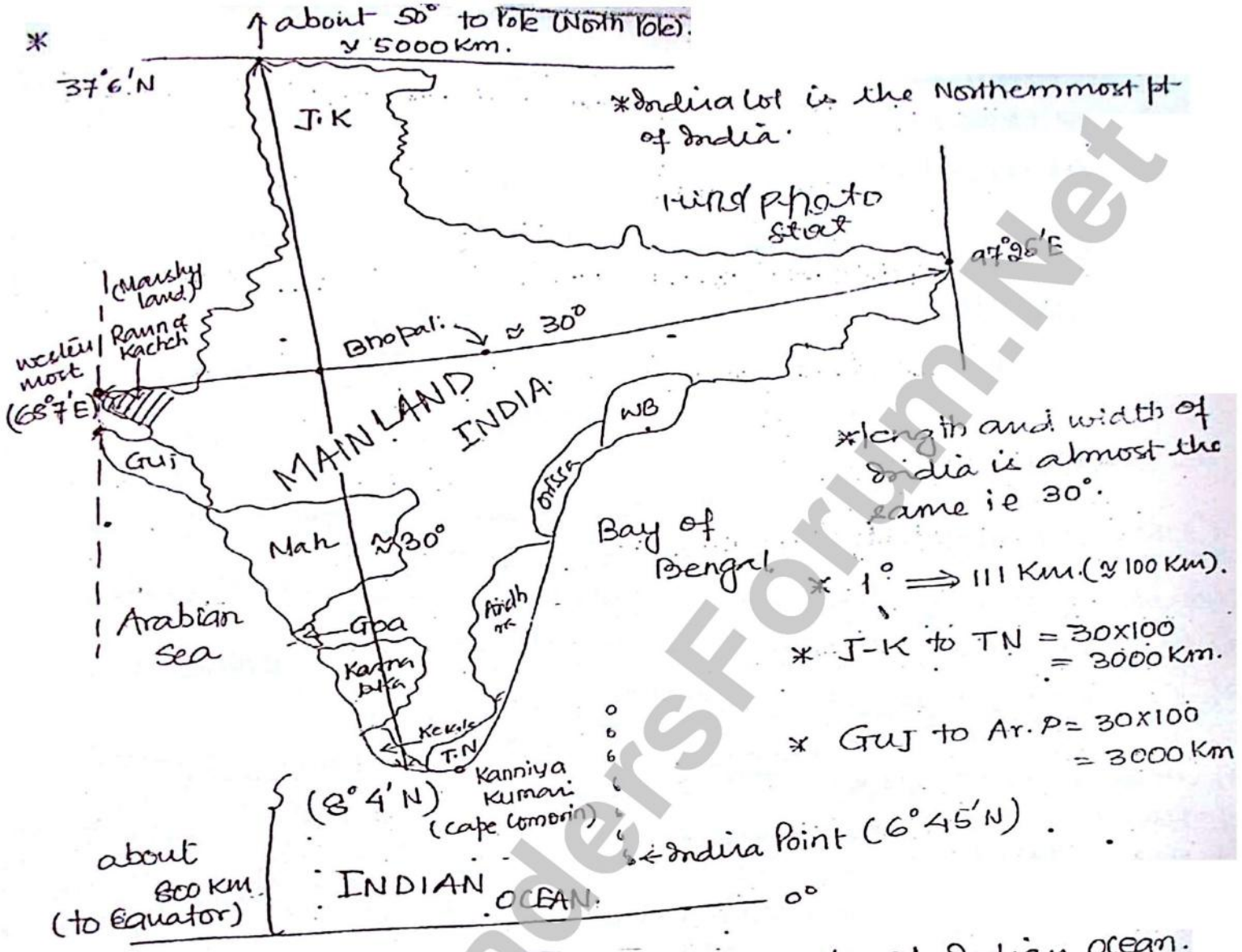

*Length and width of India is almost the same ie 30°.

* 1° ⟹ 111 Km. (≈ 100 Km).

* J-K to TN = 30×100 = 3000 Km.

* Guj to Ar. P = 30×100 = 3000 Km

* Arabian Sea and Bay of Bengal are parts of Indian ocean.

* Western Coastal states

1) Gujarat (largest coastal line)
2) Maharashtra
3) Goa
4) Karnataka
5) Kerala

Eastern Coastal states

1) West Bengal.
2) Orissa
3) Andhra (2nd largest coastal line).
4) T.N

* Areawise categories of states:

1) Rajasthan
2) M.P
3) Maharashtra
4) Andhra Pradesh.
5) U.P
6) J & K

* Areawise least state: Goa

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* Population wise:-

1) U.P (≈ 20 Cr).
2) Maharashtra
3) Bihar.
4) west Bangal.
5) Andhra Pradesh.
⋮
28) Sikkim.

* Areawise Including Territories & Population wise

⋮

Lakshwadeep (last).

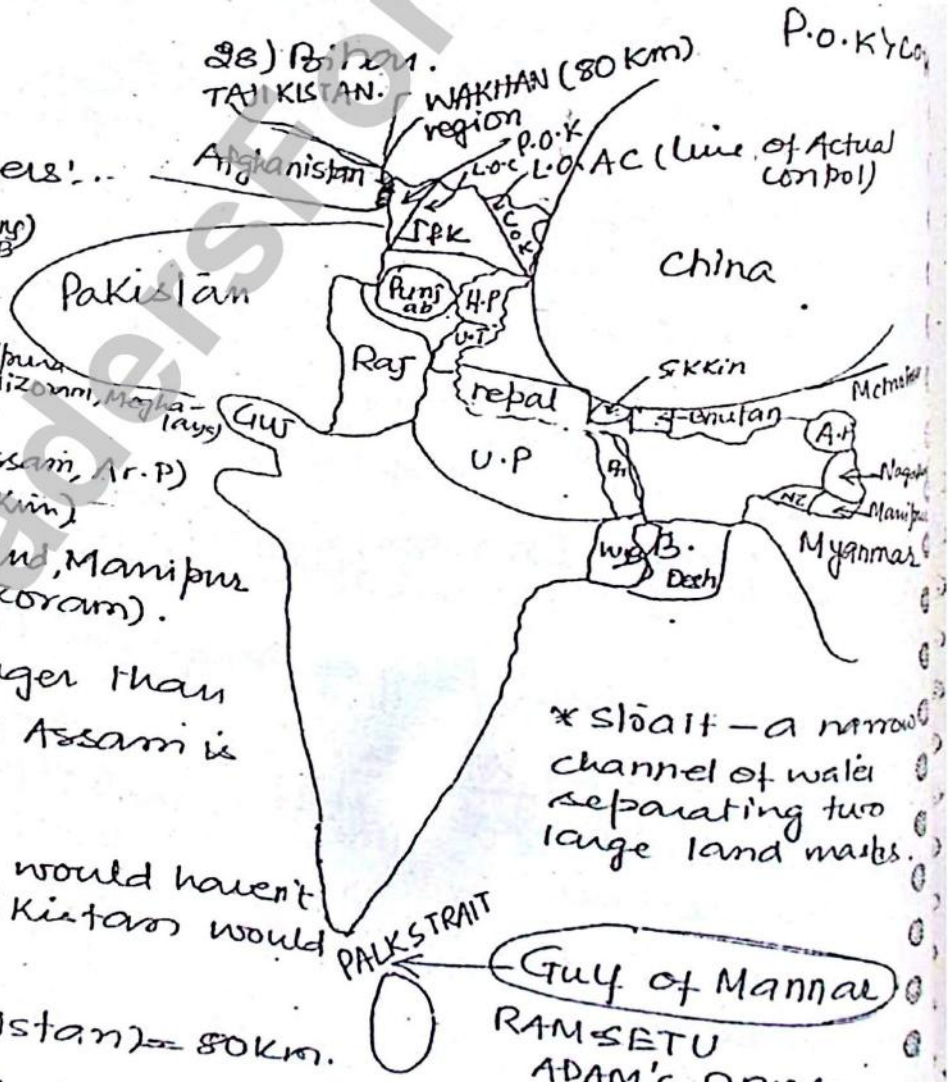
* Literacy Rate:-

1) Kerala
2) Sikkim
⋮
28) Bihar.

OUR NEIGHBOURS:-

:Countries sharing Boders:-

1) Pakistan (4 states touching) J&K, Raj, Gu, PB
2) China (J&K, HP, UK, Ar.P, Sikkim)
3) Bangladesh (NB, Assam, Tripura, Mizoram, Meghalaya)
4) Afghanistan) (J&K)
5) Bhutan (Sikkim, WB, Assam, Ar.P)
6) Nepal (UK, UP, Bar, WB, Sikkim)
7) Myanmar. (Ar.P, Nagaland, Manipur, Mizoram).



Areawise Ar. Pradesh is larger than Assam, but in population Assam is above. Ar. Pradesh.

* Strait – a narrow channel of water separating two large land masses.

If Afghanistan (Wakhan) would haven't been touching India, Tajikistan would be our Neighbour.

Smallest Border (Afghanistan) = 80 Km.
longest Border (Bangladesh = 4000 Km)

RADCLIFFE LINE (1947) ⟶ Bangladesh + Pakistan.
(Not in J&K)
(drawn b/w Gus, Raj, Punjab).

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* McMOHAN LINE: B/w India & China (only in Arunachal Pradesh)

* India & Sri Lanka ⟶ Gulf of Mannar.

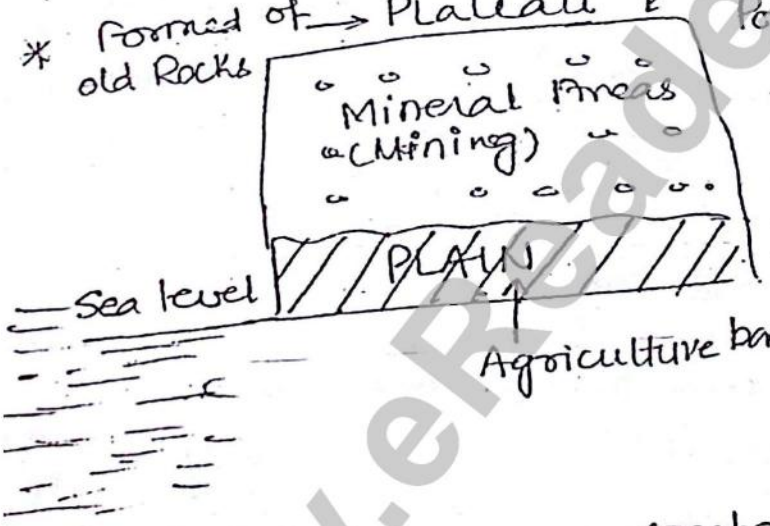
* India & Srilanka ⟶ Narrow channel of water (PALK STRAIT)

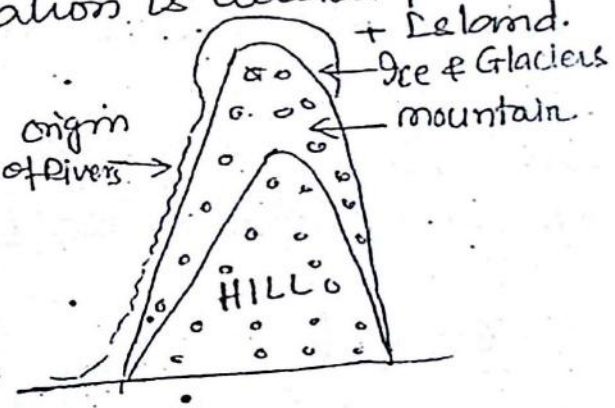
* PHYSIOGRAPHIC REGIONS:- HIND PHOTOSTAT

- Northern Mountains
- Great Plains (PB, UP, Bihar, WB etc)
- Peninsular Plateau (C.G, A.P, MP etc.

* other than above, another classification is Coastal plains + Island.

* Formed of old Rocks → Plateau ← Flat Portion.





* Plains are young as compared to Plateaus.
* Hill may be young as well as old.
  - ↓ Shivalik hills
  - ↓ "Aravali hills" (in Rajasthan) (Known for minerals).

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NORTHERN MOUNTAINS:-

- Trans Himalayas. (Trans – means beyond) → Karakoram, Ladakh, Zaskar.
- Himalayas → Great Himalayas, Lower Himalayas, Shivalike.
- North East Hilly Region.

* Greater Himalayas also called as "HIMADRI" or "INNER HIMALAYAS"
* Highest mountain chain in the world.
* Famous Mountain Peaks in the Greater Himalayas:-
  1) Nanga Parbat
  2) Nanda Devi

Glaciers are also found in the Great Himalayas:-
1) Gangotri
2) Yamunotri
3) Milam – origin of Kali River.

1 Km ↑ 6.5°C ↓

General height of Great Himalayas = 6 Km.

Lesser himalayas have height of 1 Km. Tourist Resorts such Shimla, Nainital, Mussoorie, Darjeeling, Gulmarg, Sonmarg Dalhousie lies in Lesser Himalayas.

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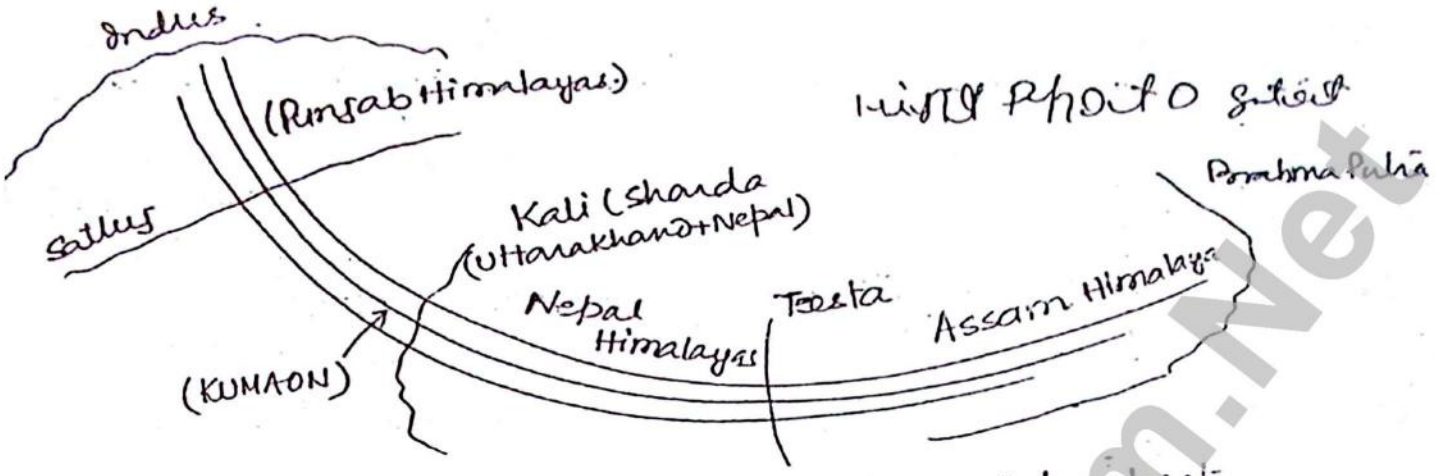
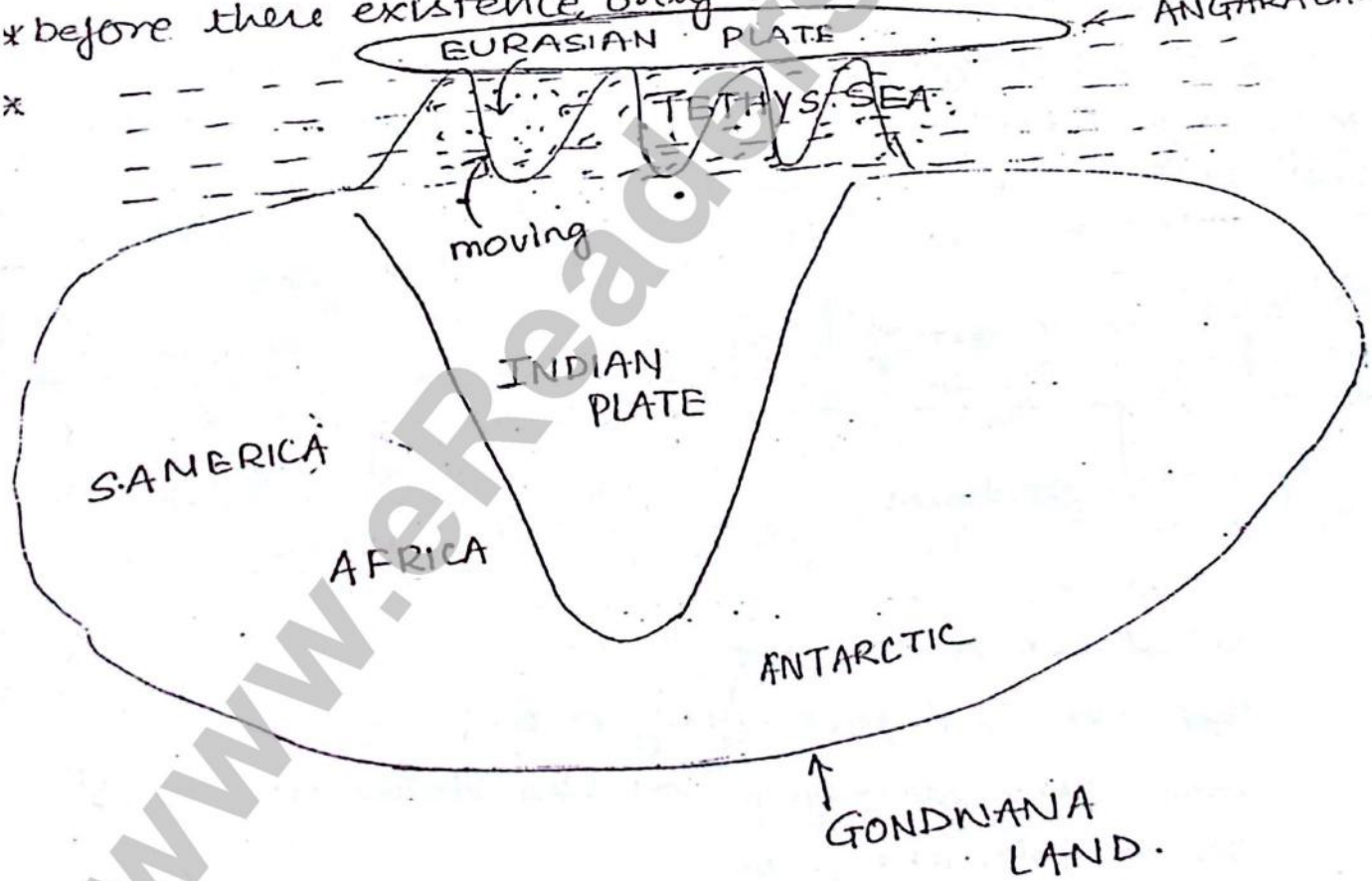


* Nepal Himalayas are the longest and highest
* KUMAON is the shortest & smallest.

* GEOGRAPHY OF HIMALAYAS:

* 65 million years old (belonges to Tertiary Period).
* one of the youngest folded mountain ranges.
* before there existence only Peninsular Plateau existed.
*



* Compression/shrinking of Tethys Sea took place
* Sea had large amount of marine sediments

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: As more and more compression took place that resulted in the rise of mountains (Folded Mountains).

: Himalayan chain contains of Marine sediments of the "TETHYS SEA".

: with the 1st collision GREAT HIMALAYA formed.
with the 2nd collision LESSER HIMALAYA formed.
with the 3rd collision __ SHIWALIK were formed.

: Height of Mt Everest : 8848 m (100 yrs Back)
" " " " 8850 m (Now).

* Shivalik → youngest
Karakoram → oldest

: NORTH EASTERN HILLY AREAS :

→ Patkai Bum Hills (A.P)
→ Naga Hills (Nagaland)
→ Mizo Hills (Mizo (LUSHAI).

GREAT PLAINS :

↓ ↓ ↓

Indus Plain | Ganga Plain | Brahma Putra Plain.

River sediments called as ALLUVIAM.
sediments deposited in the low lying areas.
Our Great Plain are the youngest as the rivers originated after the formation of himalayas.

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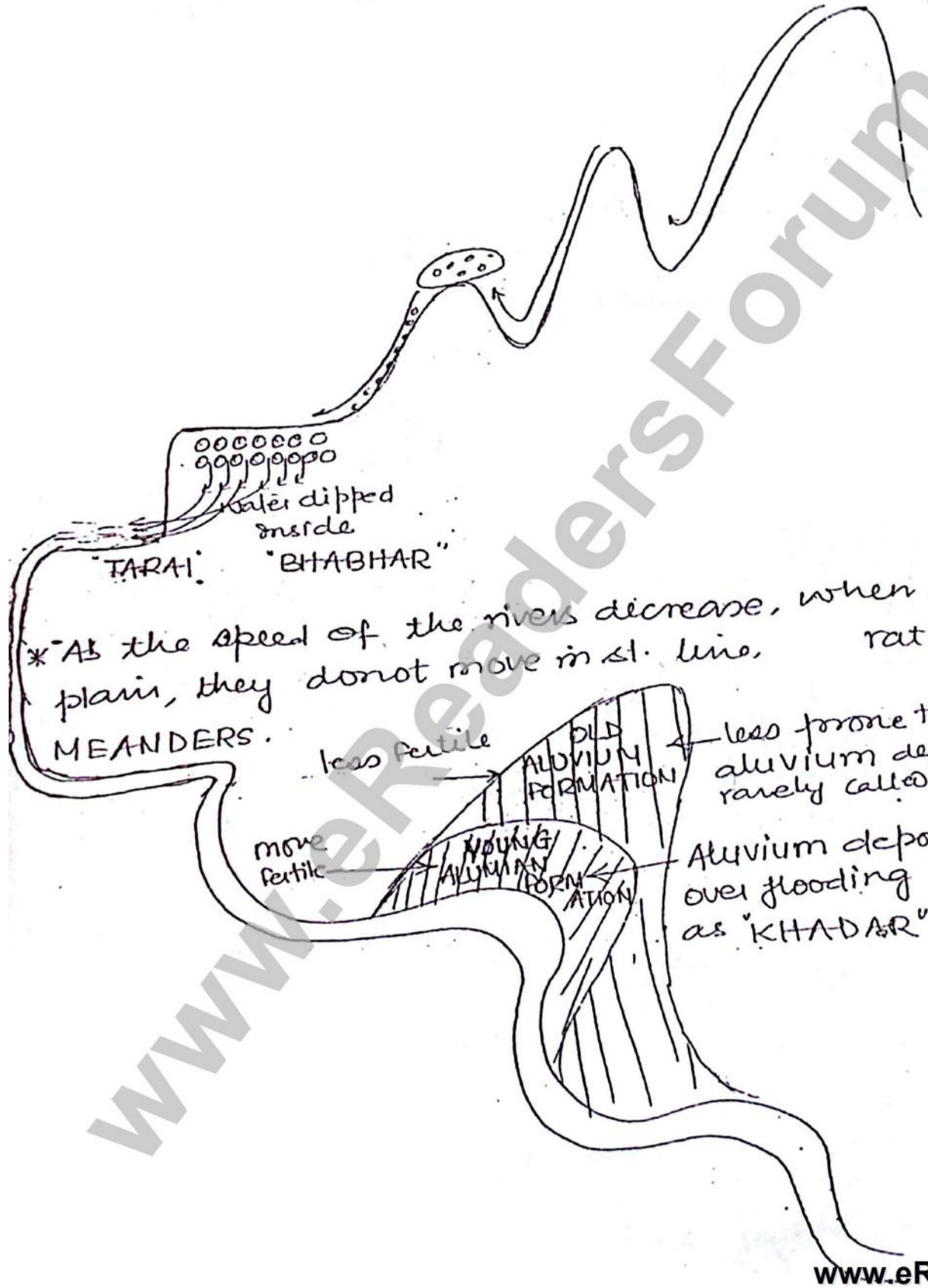
* Plains are again divided as:. (on basis of water content + size of particles)
  - → BHABHAR → COARSE PEBBLE + less water on surface
  - → TARAI → more water
  - → KHADAR
  - → BANGAR


Water dipped inside
"TARAI"
"BHABHAR"
less fertile
OLD ALLUVIUM FORMATION
more fertile
YOUNG ALLUVIAN FORMATION
less prone to flood, hence the alluvium deposit takes place rarely called as BANGAR
Alluvium deposited due to the over flooding of River called as "KHADAR"

*As the speed of the rivers decrease, when they enters the plain, they donot move in st. line, rather they form MEANDERS.

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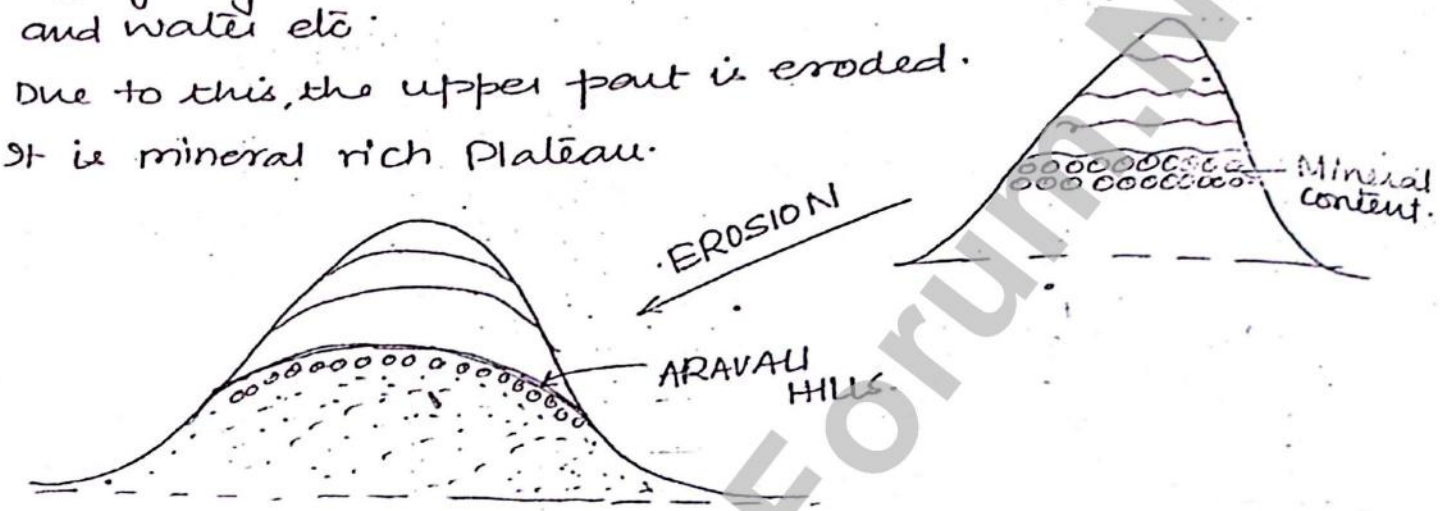
* PENINSULAR PLATEAU:-

Maxm area covered in India and the oldest part of India.

Highly degraded in nature. It is eroded by Rivers, wind and water etc.

Due to this, the upper part is eroded.

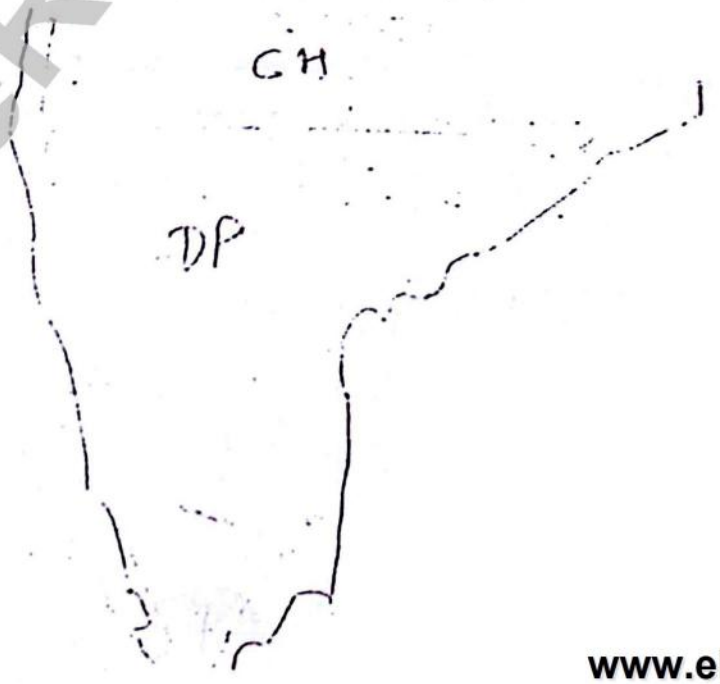
It is mineral rich Plateau.



These are lacking in nutrients and not suitable for doing Agriculture.

Peninsular Plateau :-

- Central Highland (Jh, CG, MP)
- Deccan Plateau
- Meghalaya Plateau. (oldest state of N. East)



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Highland:

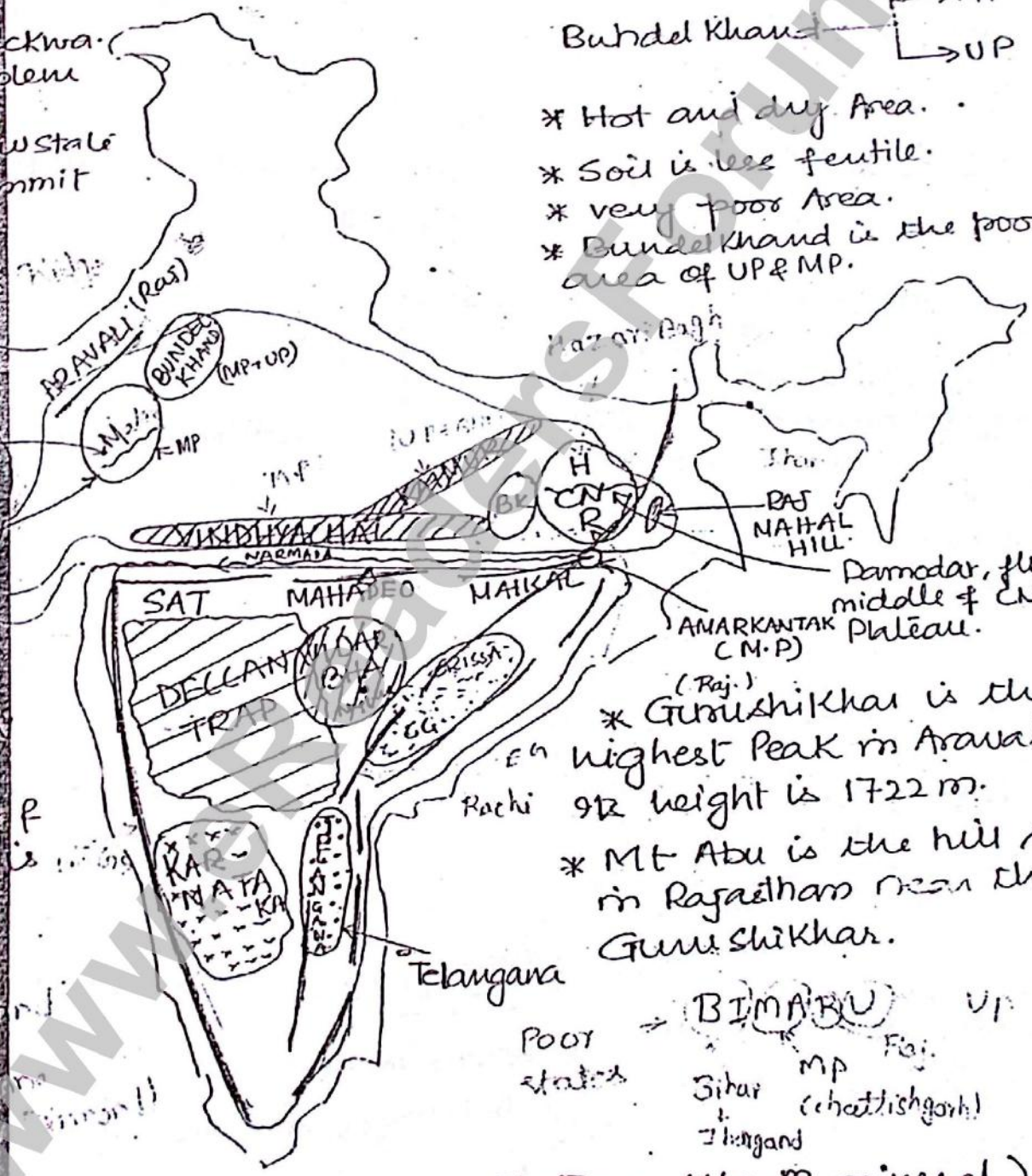
consist of both Plateau & Hills.

- Plateau
  - MALWA
  - BAGHEL KHAND
  - CHHOTA NAGPUR (largest among them)
  - BUNDELKHAND
- Hills
  - Aravali hills
  - Vindhyachal hills → KAIMUR (Branch)
  - Rajmahal hills

ARAVALI hills are oldest fold mountain on Earth.
stands from Rajasthan to Haryana to Delhi.

Bundel Khand → MP, UP

* Hot and dry Area.
* Soil is less fertile.
* very poor Area.
* Bundelkhand is the poorest area of UP & MP.



* Gurushikhar is the highest Peak in Aravali. Its height is 1722 m.
* Mt Abu is the hill station in Rajasthan near the Gurushikhar.

BIMARU
Poor states → Bihar, MP, Raj, UP, Orissa
Jharkhand, Chhattisgarh

Plateau (Max^m mineral)

- Mineral Rich
  - whole Jharkhand
  - Parts of Odisha, Chattisgarh & WB

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MALWA :-

- Region known for Black Soil
- : CHAMBAL is the major rives passing through MALWA Region

BUNDELKHAND :-

UP & MP
Normal soil
Dry & hot Area.
Among the Poorest Region of India.

BAGHELKHAND :-

Mainly MP.

CHHOTA NAGPUR PLATEAU :-

DECCAN PLATEAU :-

HILLS
1) Western Ghats
2) Eastern Ghats
3) SATPURA

PLATEAU
1) Deccan TRAP
2) Telangana
3) Karnataka.
4) Vidharva.
5) Dandkaranya.

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SATPURA HILL :.

Basic parts of Satpura Hill is:.

1) Satpura.
2) Mahadeo. (High peak - Dhupgarh) ← Pachmarhi hill Resort
3) Maikal 1350m

*Narmada is the famous river which divide the vindyach and Satpura.

* Mainly MP, and parts of Maharashtra & Chattisgarh.

* Satpura making boundary of MP & Maharashtra.

* Highest Peak is Dhupgarh, and Pachmarhi is the hill station (1350m)

MAIKAL :.

* Famous place is AMARKANTAK.

* origin pt. of Narmada River.

* DECCAN TRAP :.

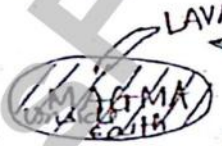
*largest Plateau in India.

* Black Soil Rich.

* Mainly in Maharashtra

*COTTON CROP is grown.

Reason of Black soil development



← Black lava cement & Black soil is formed.

* Black lava is also called as BASALT LAVA.

* Basalt lava has high content of MAGNETITE.

* TELENGANA :.

* Mainly in Andhra.

* Inland area of Andhra.

* one of most Backward region in India.

Driest area in South India.

Prone to Draught, less rain.

KARNATAKA :.

Rich in mineral source after Chotta Nagpur

MH - Gadchiroli
Chandrapur

ANDKARANYA :.

one of the most poorest Region of India.

Mainly in C.G & ORISSA

Most affected Regions of C.G

- Dantewada
- Bastar
- Kanker

In odisha: (KBK) ← Poorest Region of India.

a) Kalahandi
b) Bolangir
+ Nalkangiri

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VIDARBHA :- (cont MH.)

1) Nagpur is the Centre
2) Part of Deccan Trap.
3) Most farmers committed suicide after TELANGANA
4) Portion of Eastern Maharashtra.

:RED CORRIDOR:-

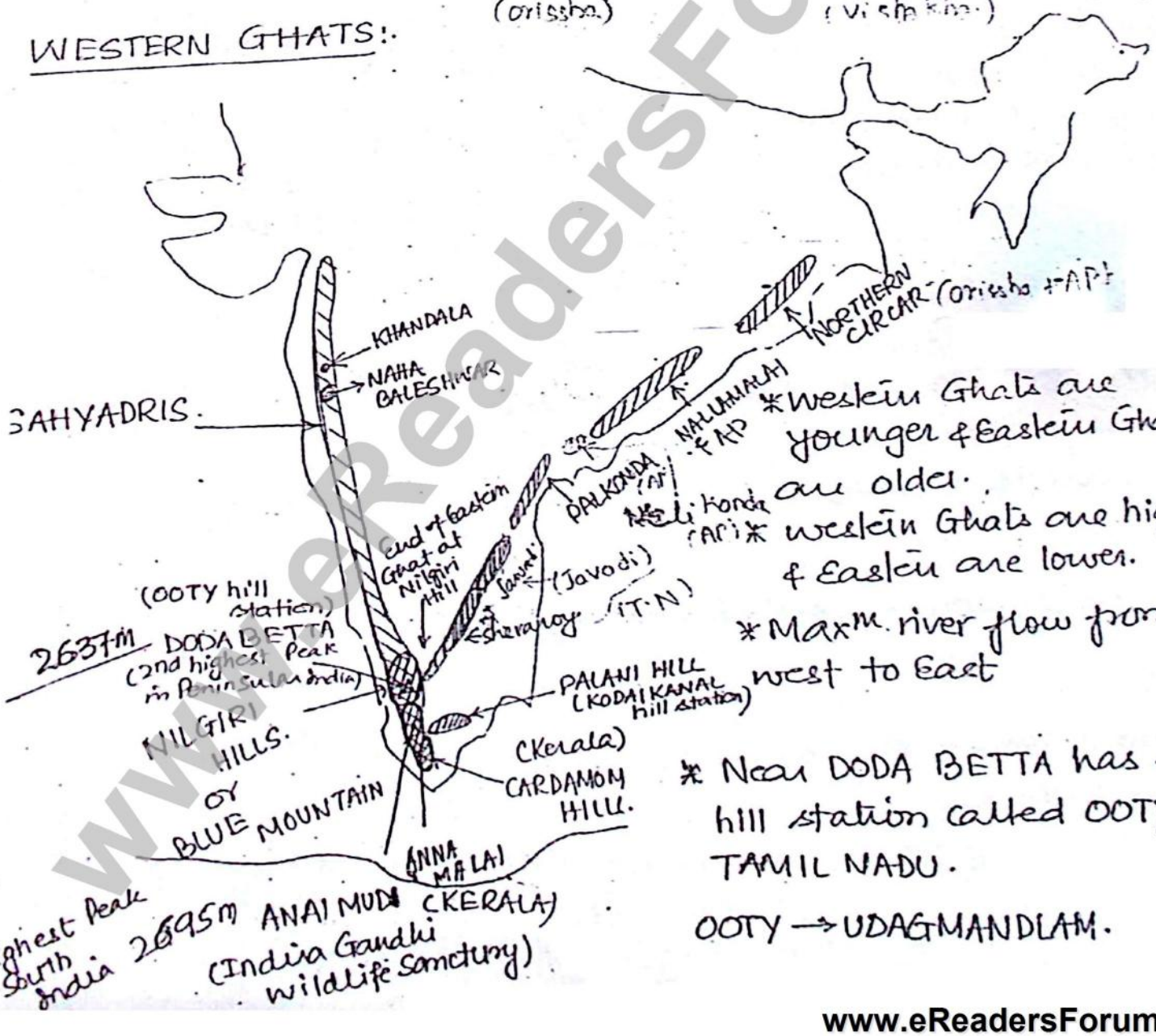
:Red stands for Naxalism.
:Naxalism is extreme form of MAOISM.

NAXAL came up from WB, near Darjeeling a village called as NAXALBADI during 1970's. These activities mainly ranges from Telangana, CG, Odisha, Jharkhand, Bihar, WB and upto Nepal.

Mahendragiri (Orissha)

Arma Konda (1680m) highest peak in Eastern ghat (Vishakha.)

WESTERN GHATS:-



* Western Ghats are younger & Eastern Ghats are older.
* Western Ghats are higher & Eastern are lower.
* Max^m. river flow from west to East

* Near DODA BETTA has a hill station called OOTY in TAMIL NADU.

OOTY → UDAGMANDLAM.

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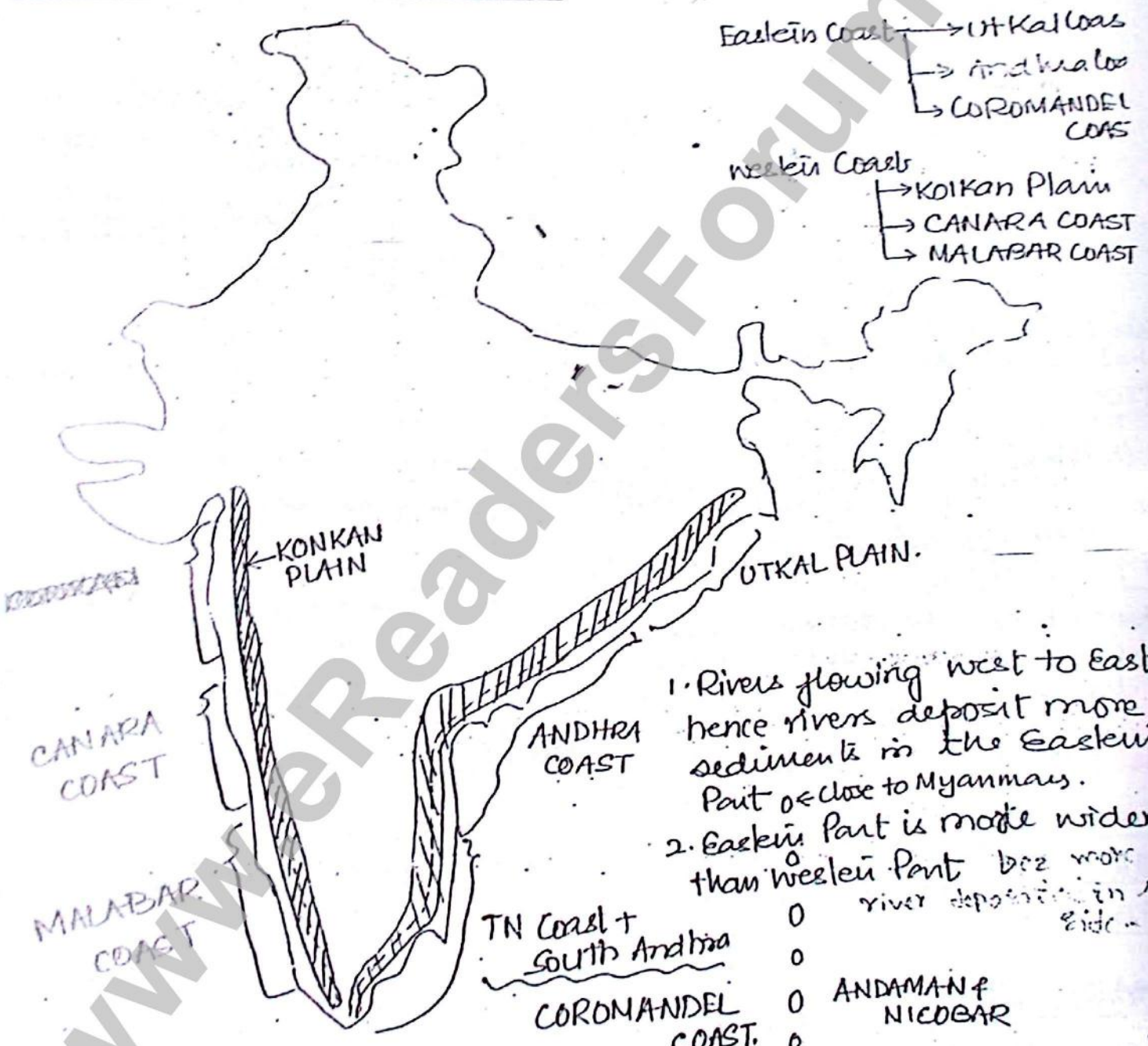
* Eastern Ghats are older than the western Ghats.
* Eastern Ghats are broken and irregular.
* Eastern Ghats are older than the ARAVALI HILLS.
* Aravali is oldest fold mountain, but Eastern Ghat is not a fold mountain.
* Chottanagpur is older than Eastern Ghats.

*COASTAL REGIONS OF INDIA:



1. Rivers flowing west to East hence rivers deposit more sediments in the Eastern Part of close to Myanmar.
2. Eastern Part is more wider than Western Part bcz more river deposition in this side.

(North East Monsoon (wind)) (Oct., Nov., Dec.) rain fall reaches ← Indira Point.

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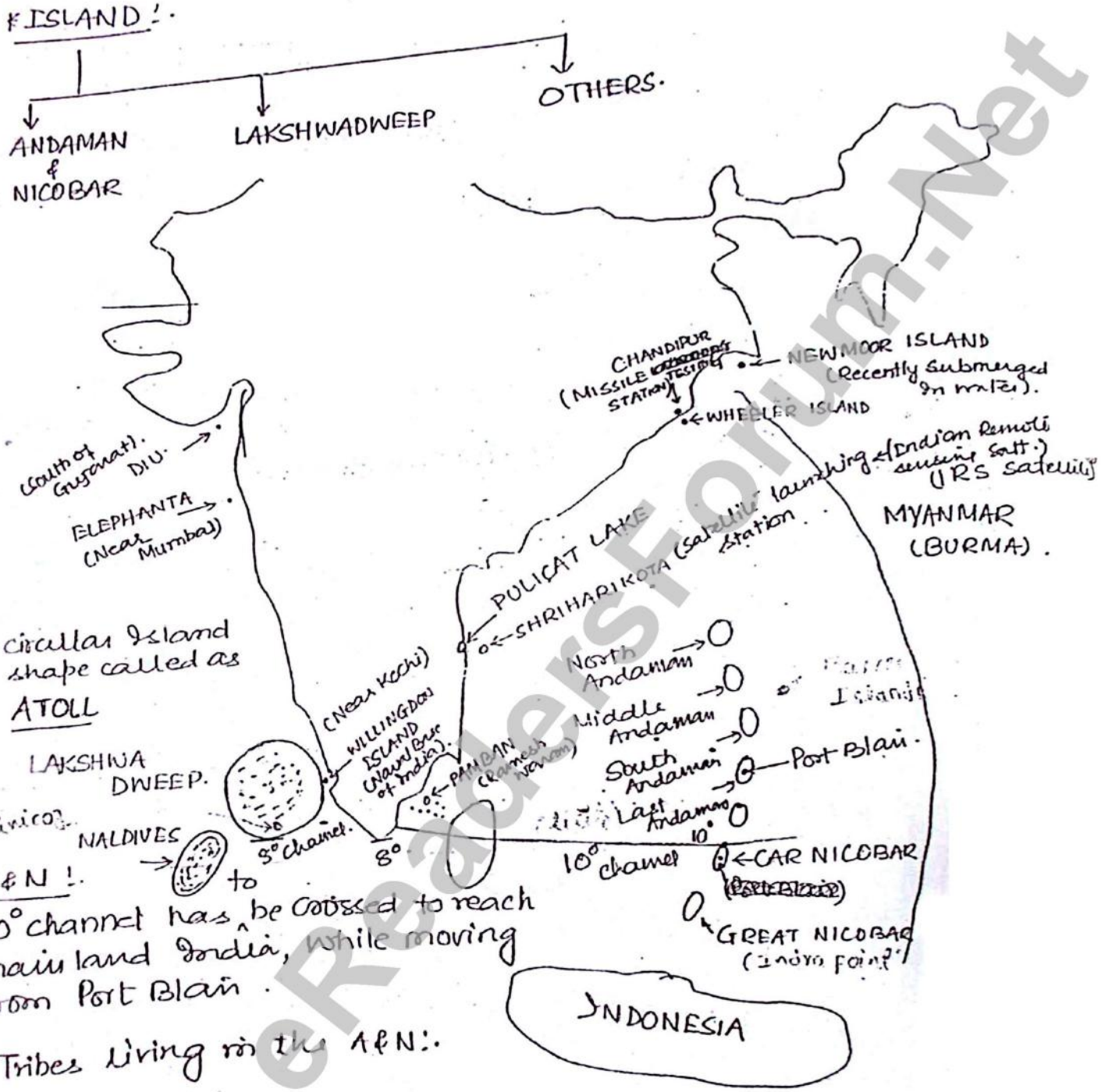
* ISLAND :-

ANDAMAN & NICOBAR

LAKSHWADWEEP

OTHERS.



circular Island shape called as ATOLL

A & N :-

10° channel has be crossed to reach main land India, while moving from Port Blair.

Tribes living in the A & N :-

1) JARNAS } features of NEGRITOS, as of Negroes in Africa.
2) ONGES }
3) SENTELESE

LAKSHWADWEEP :-

These are CORAL REEF ISLAND (organic Rocks of micro-organi
u-organisms living in sea have cover of limestone.
After their death, only their limestone shell remains, and

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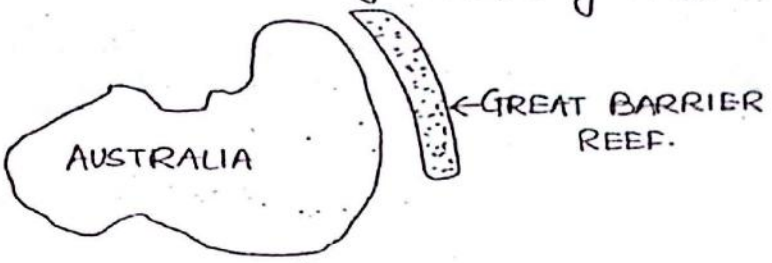
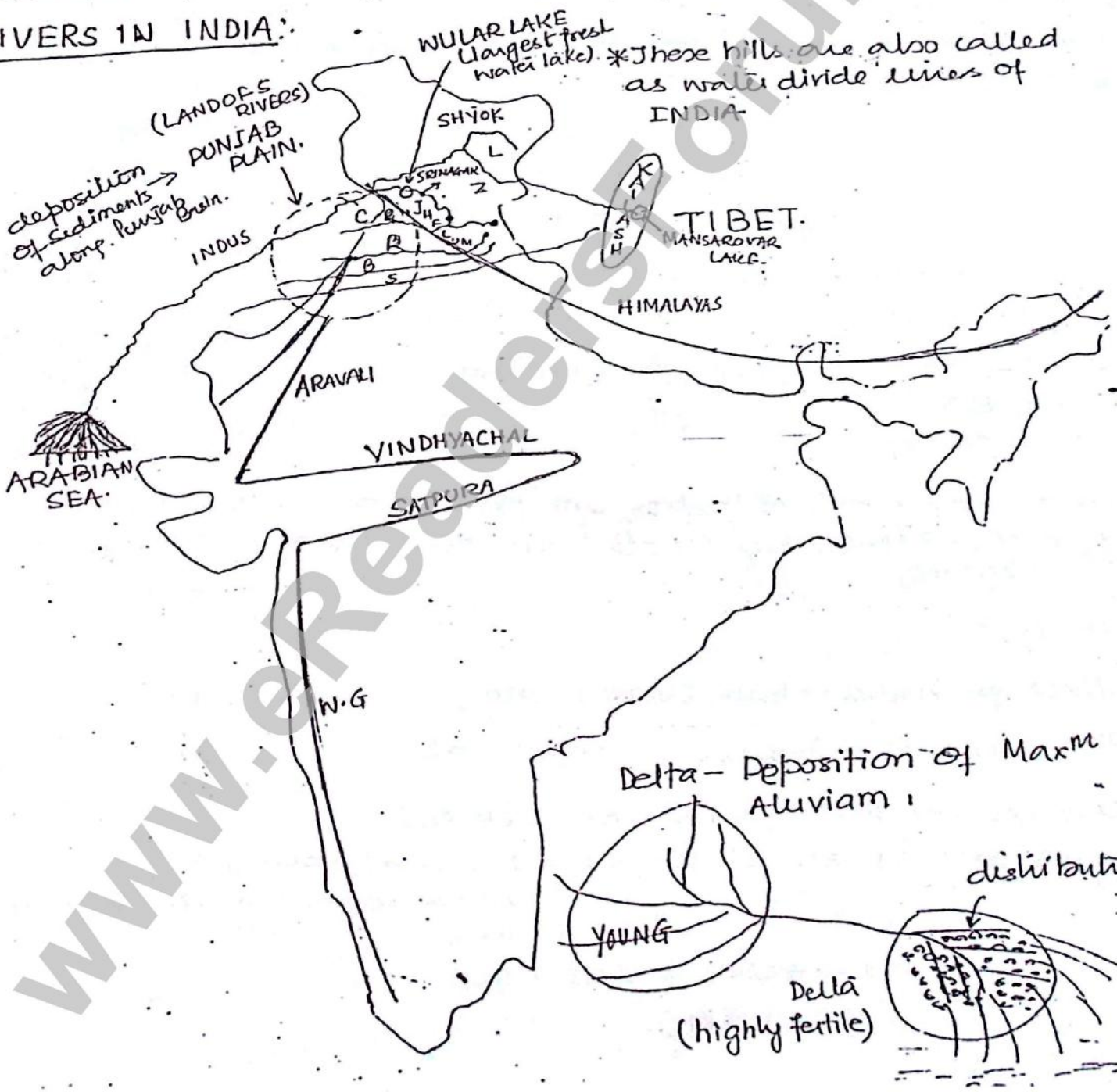
* Southernmost Island of LAKSHDWEEP is MINICOY.
* 8° channel has to be crossed for reaching MALDIVES.



* Sri Hari Kota, Indian Remote Sensing satellites are launched.
* CHANDIPUR/WHEELAR ISLAND – Missile Testing Station

* RIVERS IN INDIA:



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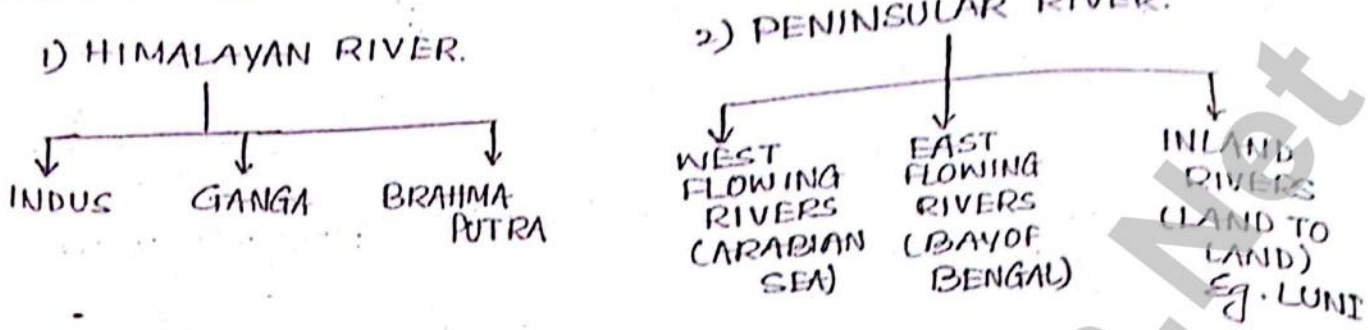
Rivers are divided as:-



HIMALAYAN RIVERS:-

1) INDUS SYSTEM:-

*Kailash Mountain chain in Tibet (China)
: Kailash Mountain has Mansarovar Lake.
· Flows through China, India & Pakistan.
· Drains to Arabian sea.

INDUS is famous for having 5 tributaries:-

1) Jhelum. ← originates in J&K.
2) Chenab
3) Ravi } originate in Himachal.
4) Beas.
5) Sutlej.

To share the water of Indus, UN played Imp Role by the help of WORLD BANK. They created an INDUS-WATER TREATY. (In 1960) (IWT).

Acc. to IWT:-

a) 3 Rivers for India → Ravi, Beas & Satluj

b) 3 Rivers for Pak – Indus, Jhelum, Chenab.

Irrigation on the Rivers for Pak are objected
Hydropower projects are allowed (but it is also objected by Pakistan regarding the height of Dam).

BAGLIHAR → Chenab River (disputed DAM).
(Largest Hydropower Project in J&K).

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* KISHANGANGA PROJECT (Small tributary of Jhelum) —— Jhelum River (made by India)

* NEELAM PROJECT (POK Region) ⟶ Jhelum River (made by Pak, collaboration of China).

*Indira Gandhi Canal has water of Ravi, Beas, Sutlej and sends water to Rajasthan.

* origin of Indira Gandhi Canal in Punjab is "HARIKE BARRAGE"

*

BHAKRA-NANGAL —— Sutlej (Punjab & HP)

* NATHPA-JHAKRI —— Sutlej (HP) (largest Project of N. India in terms of Production)

BEAS

*PONG (MAHARANA PRATAP SAGAR) DAM — H

* RANA PRATAP SAGAR (CHAMBAL) ⟶ Rajasthan

* RANJEET SAGAR —— Ravi (Punjab).

*Max^m use of Sutlej in the Indus system:

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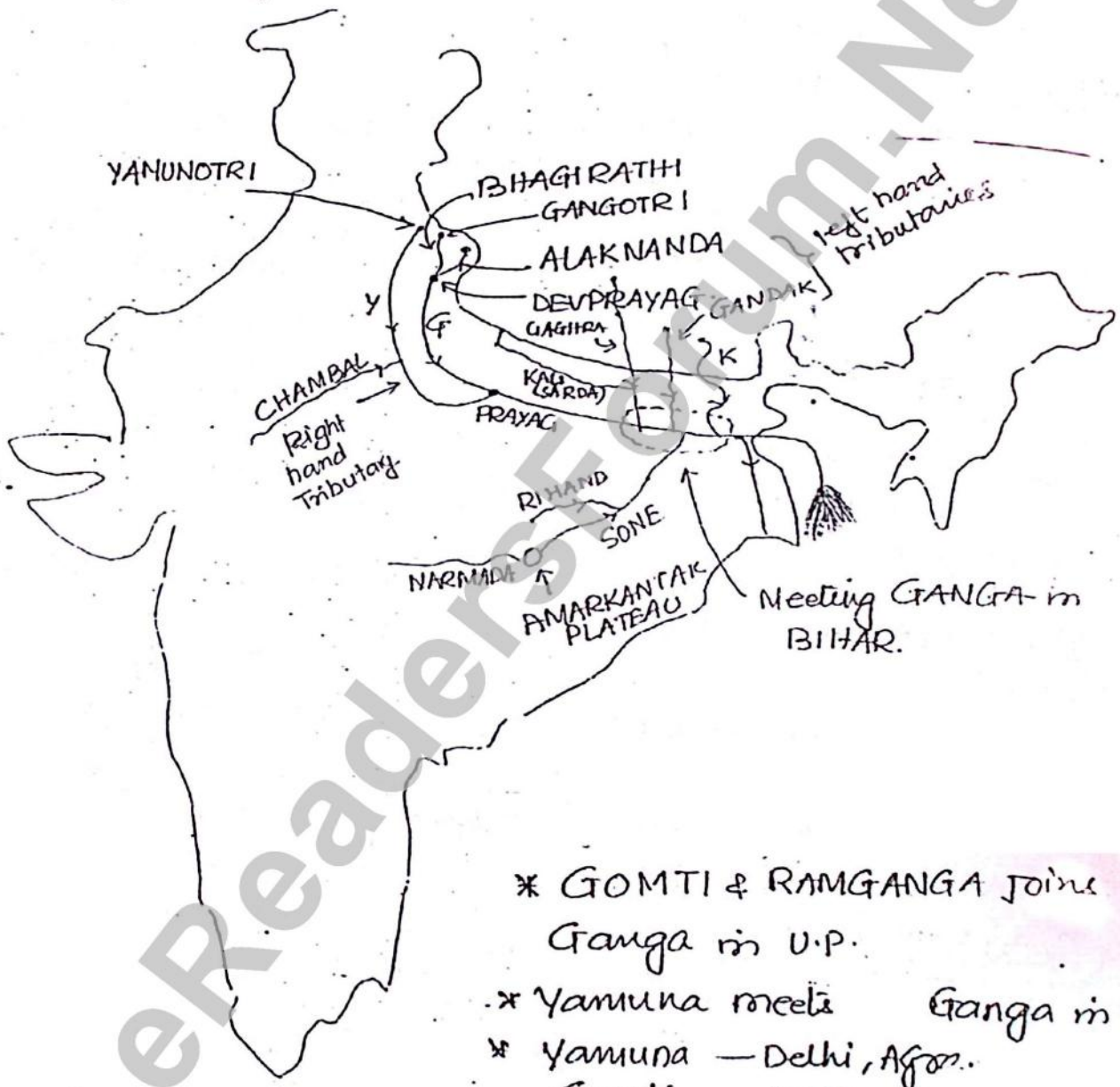
* GANGA SYSTEM :

* originates from Gangotri Glacier in Uttarakhand.
* Initially Ganga is called BHAGIRATHI



* GOMTI & RAMGANGA Joins Ganga in U.P.
* Yamuna meets Ganga in UP
* Yamuna — Delhi, Agra..
  Goomti — Lucknow.

: Another River ALAKNANDA joins Bhagirathi River in DEVPRAYAG. And from that place, its name is Given GANGA

YAMUNA is longest tributary of GANGA

2nd longest tributary of Ganga is GHAGRA, originating in Tibet

GANDAK — originating in Nepal

KOSI — " " "

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* TEHRI DAM — built on BHAGIRATI in uttarakhand & under constn. (261 m) (Highest Dam in India). (Bhagra-Nangal — 2nd highest Dam)

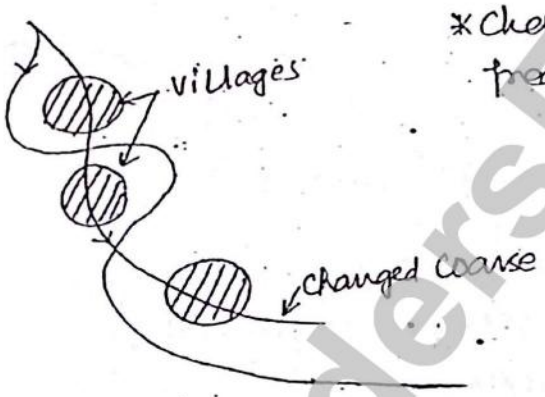
* 3 longest river of GANGA System:
  a) Yamuna
  b) Ghagra.
  c) Sone

* Chambal river is longest tributary of Yamuna.

* RIHAND DAM built on Sone River in U.P.

* KOSI is called as SORROW OF BIHAR.

*KOSI:



* Changes the coarse, very frequently.

* While Reaching WB, it bifurcates:
  1) one part HOOGHLY in WB.
  2) another part PADMA in BANGLADESH

BRAHMA PUTRA SYSTEM:

* length = 2910 m.
* water content is high.
* Speed is high.
* More hydroprojects (about 31%).
* Arunachal Pradesh - fulline of hydroprojects on Brahmaputra.

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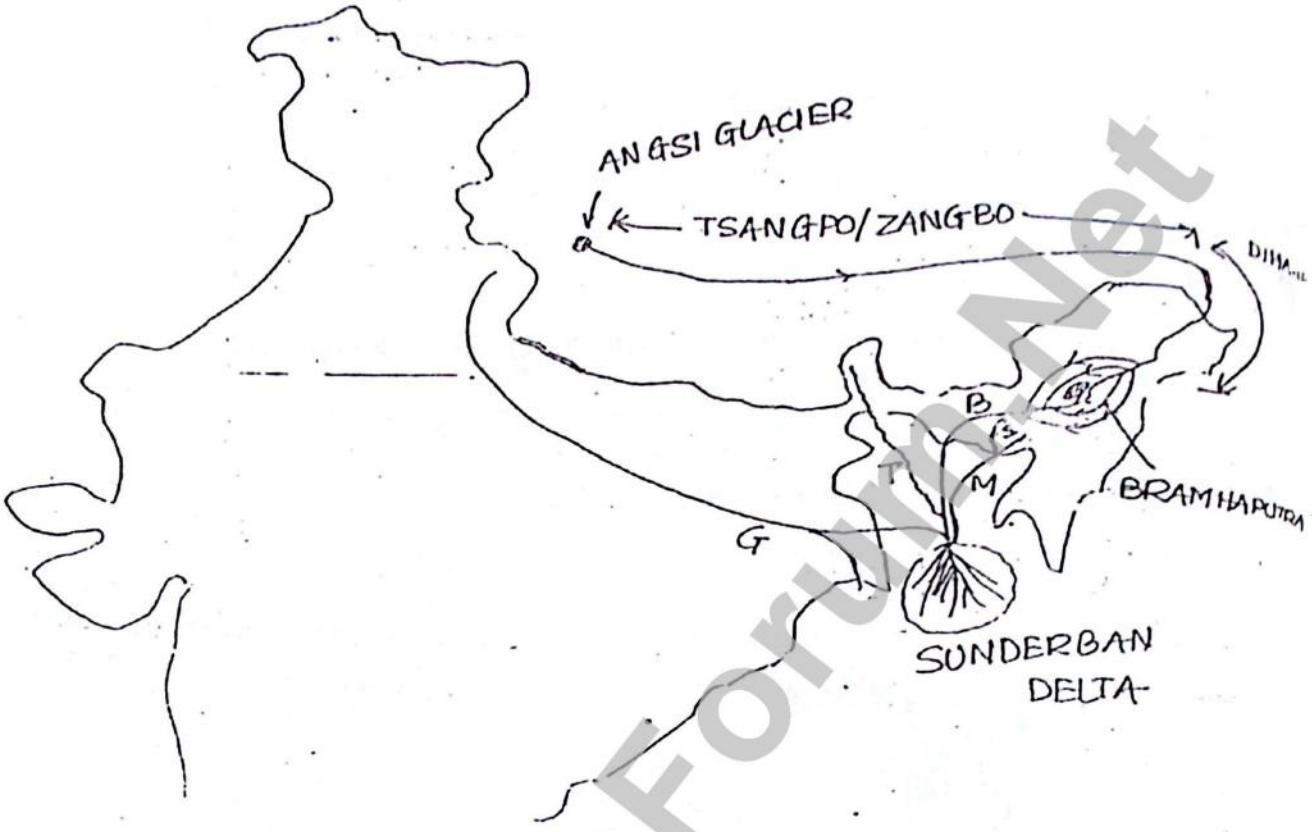
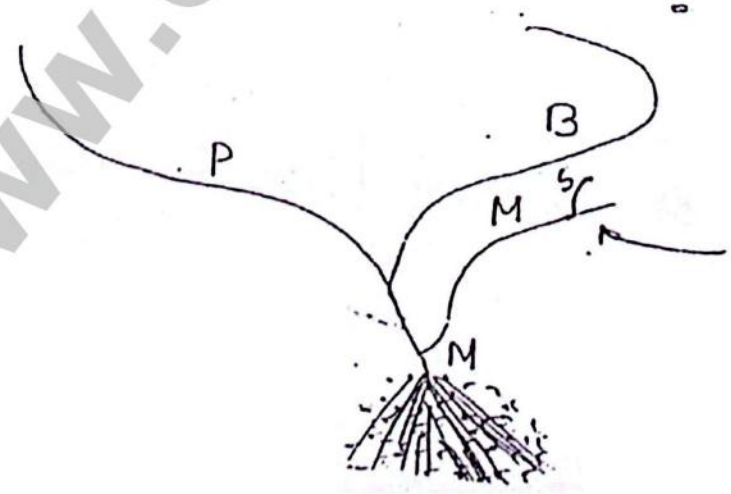


: In Tibet called as TSANGPO
In Ar. Pradesh called as DIHANG
In Bangladesh called as Jamuna
In Assam called as BRAMHAPUTRA
When Ganga enters Bangladesh, it is called PADMA
When Brahmaputra, joins Ganga, the name remains PADMA
Another River Meghna, joins the 2 rivers in Bangladesh
and the 3 rivers together called as MEGHNA



SURMA in Assam & BARAK in Manipur Joins Meghna River.

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Tributary of Brahmaputra:

Famous tributary of Brahmaputra:

1) TEESTA (SIKKIM)
2) SUBANSIRI (Assam + Arunachal).
3) DIBANG (Arunachal)
4) LUHIT (Arunachal + Assam)

* Subansiri + Luhit meets Brahmaputra in ASSAM.

* Flood Prone Areas of India:
  a) Brahmaputra (ASSAM)
  b) KOSI (BIHAR).

* TEESTA PROJECT (SIKKIM). ← Running
  SUBANSIRI " (Ar. + Assam) } under
  DIBANG " (Arunachal). } const^n.

* Initially TEESTA was tributary of GANGA, but later on it was captured by BRAMHAPUTRA. It is called as "RIVER CAPTURING"

* BRAMHAPOTRA is known to bifurcate in ASSAM, and an Island called as RIVER ISLAND is formed.

* largest RIVER ISLAND of India is MAJULI ISLAND in ASSAM by BRAMHAPUTRA RIVER

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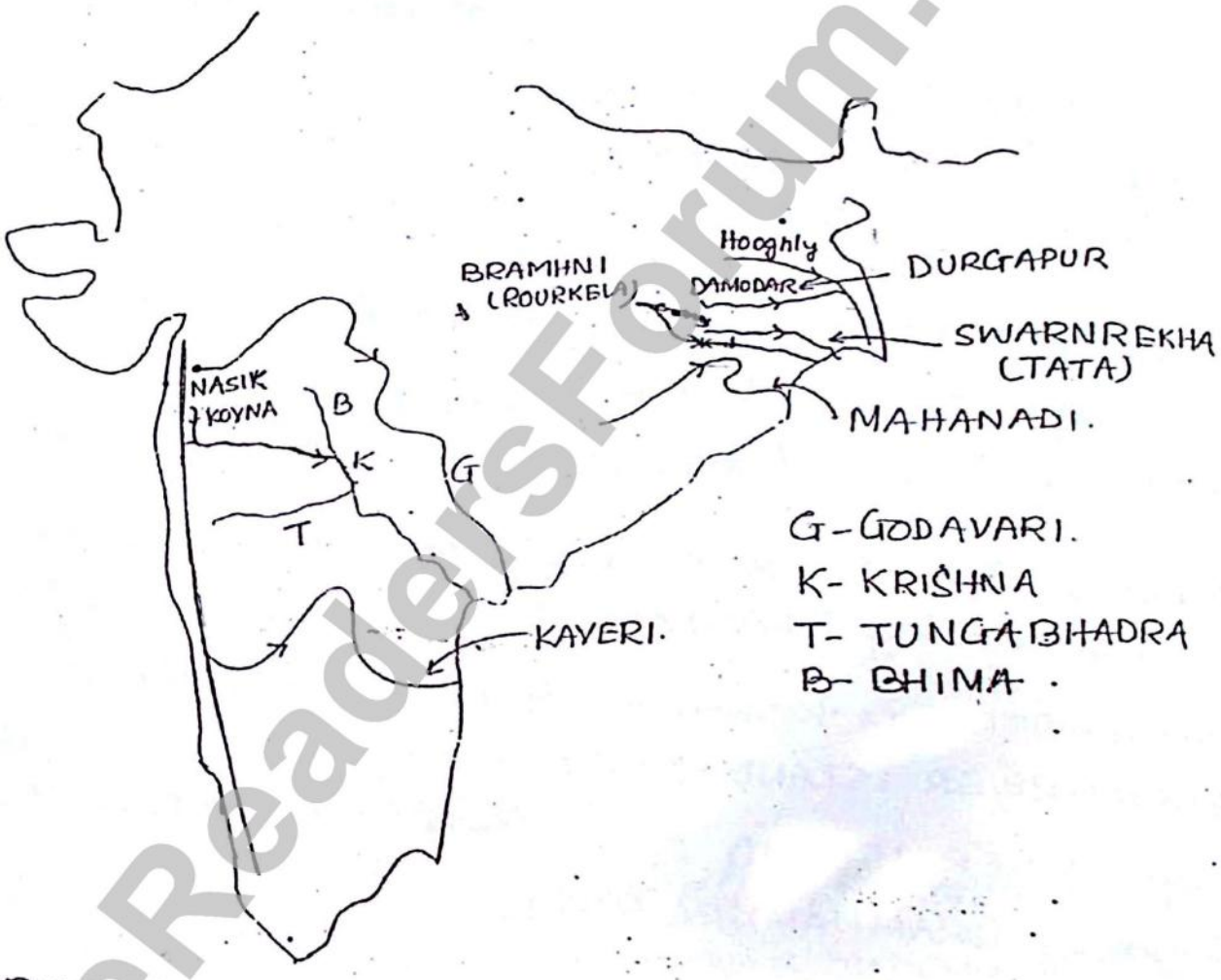
PENINSULAR RIVERS:

- West flowing
- East flowing
- Inland Rivers

East Flowing Rivers:



DAMODAR RIVER — maxm coal reserve of India divides chotta nagpur in 2 parts

1st multipurpose river valley projects (MPRPV) called as DVC.

DURGAPUR — DAMODAR RIVER (JH & WB)

TATA — SWARNREKHA (JH)

ROURKELA — BRAHMNI (OR).

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MAHANADI — origin in Chattisgarh, max^m in odisha.

GODAVARI :-

* 2nd longest of India after Ganga — Godavari (longest River in South India)
* Due to similarities with Ganga, Godavari also called as DAKSHIN GANGA

* GODAVARI — OLD GANGA. } origin in western Ghats
BUDHH GANGA. } (At TRIMBAKESHWAR).
VRIDHH GANGA ——.

* WARDHA & MANJIRA (Maharashtra) } Famous Tributary of Godavari).
INDRAVATI — Chattisgarh

KRISHNA :-

* KRISHNA → 2nd longest River of South India
  - → originates in Maharashtra.
  - → originates from western Ghats (MAHABALESHWAR).

* NASIK — GODAVARI
HARIDWAR — Ganga
ALLAHABAD — Ganga + Yamuna
UJJAIN — SHIPRA
} KUMBH MELA

Krishna Tributary :-

1. Bhima (Mainly Mah.).
2. Tungabhadra (Andhra + Karnataka).

* NAGARJUNASAGAR PROJECT — KRISHNA RIVER (Andhra)

SRISAILAM DAM — KRISHNA RIVER. (Andhra)

* KOYNA DAM — Biggest Dam in Maharashtra. (Causing Earthquake — Water stored too much in Rock, such that Rocks start vibrating — May produce Earthquake

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KAVERI :-

* Most disputed River of India
* originales in BHARAMGIR (KARNATAKA)
* Maxm walei taken by T.N, than KARNATAKA.

* Disputes b/w :-
  - a) T.N
  - b) KARNATAKA
  - c) KERALA
  - d) PUDUCHERRY.

(Most disputed River)

* PADDY CROP — Imp. crop of this Region.

Hydroprojects :-

SHIVASAMUDRAM — Kaveri River. (KARNATAKA)
(2nd power project).

∴ 1st hydropower project — DARJEELING

KRISHNARAJSAGAR — Kaveri River (KARNATAKA)

METTUR DAM — Kaveri River (TAMIL NADU).

West flowing Rivers :-

West flowing Rivers don't make Deltas.
These Rivers have Narrow Mouths called as ESTUARY.
These Rivers are FAST,
Due to Tides, actions of moon & Earth pulling water to land, hence fresh water (rivers) is drained to sea & Sea water (Sea) is pulled to Land.

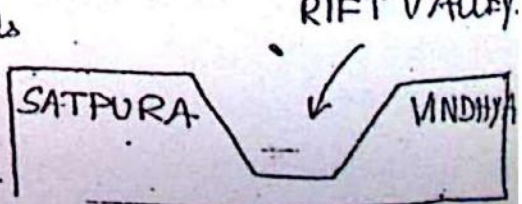
∴ Due to above, more nutrients & more Biodiversity.

NARMADA :-

NARMADA flows westward.

Because of the valley created due to intense heat & pressure of Earth.

Such valley called as RIFT VALLEY (slope towards west).
(Famous valley in middle India)



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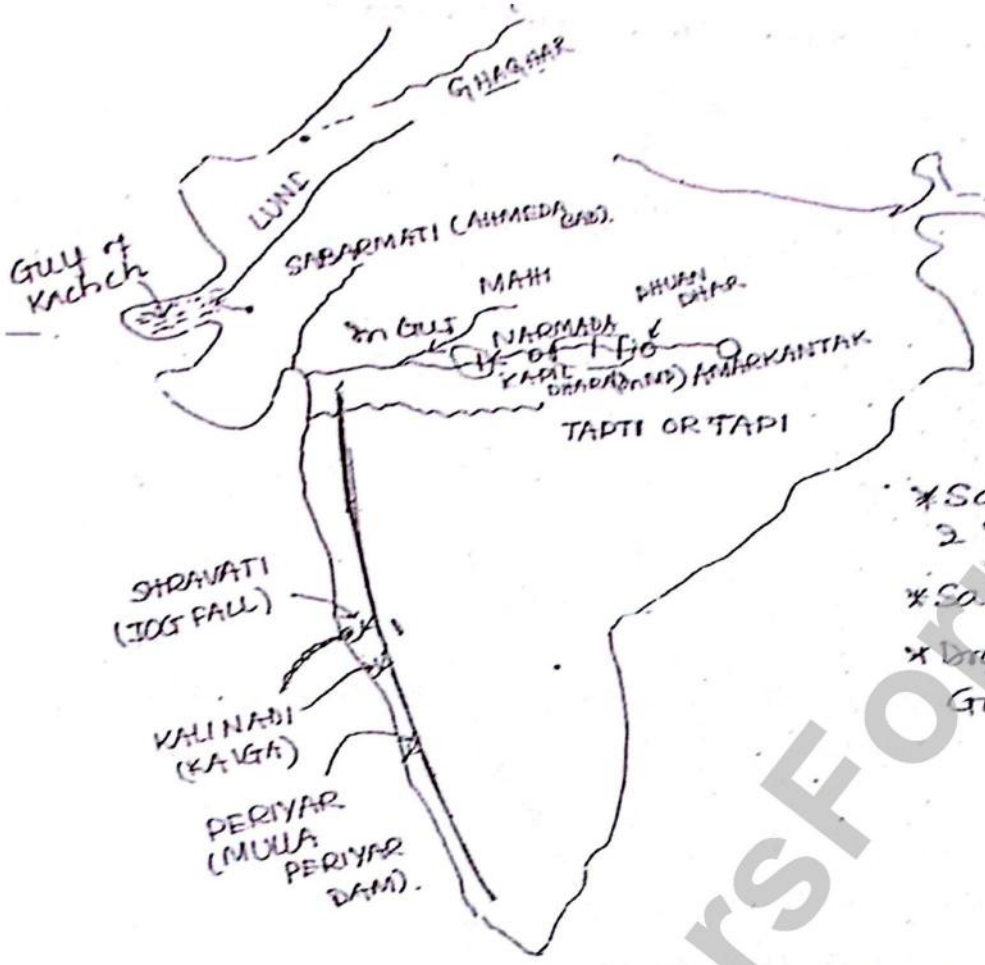

* Sabarmati & Mahi are 2 imp. rivers of Guj.
* Sabarmati – Ahmedabad
* Draining water in Gulf of Khambat

* A no. of water falls, near JABALPUR called as DHUANDHAR waterfall.

* KAPILDHARA near Dhuandhar is another waterfall

* Controversial Dams on Narmada:

1) Sardar Sarovar Dam – Gujarat } Related to "NARMADA BACHAO ANDOLAN"
2) INDIRASAGAR – MP
3) OMKARESHWAR – MP
4) MAHESHWAR – MP

TAPTI:

* SURAT situated on its banks.
* KAKRAPARA situated on TAPTI RIVER
(Nuclear station of India).

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SHARAVATI River ⟶ highest waterfall
(Karnataka) JOG/GERSOPPA WATERFALL

KALI NADI ⟶ Atomic Power station KAIGA
(Karnataka)

PERIYAR RIVER ⟶ MULLAPERIYAR DAM.
(Kerala). (located in Kerala, but managed by Tn, lease by BRITISH GOVT).

Controversy on increasing height of Dam.

*Gulf – enclosed in nature
Bay - wider in nature

NIANB RIVERS :.

1) LUNI RIVER (originates in Aravali, near AJMER & goes through (RAJ & GUJ) THAR Desert).

(HAR & RAJ)
2) GHAGGAR – dries in THAR
(Valley is very broad but less water
→ Reason may be, it has occupied the valley occupied by once flowing river SARASWATI.

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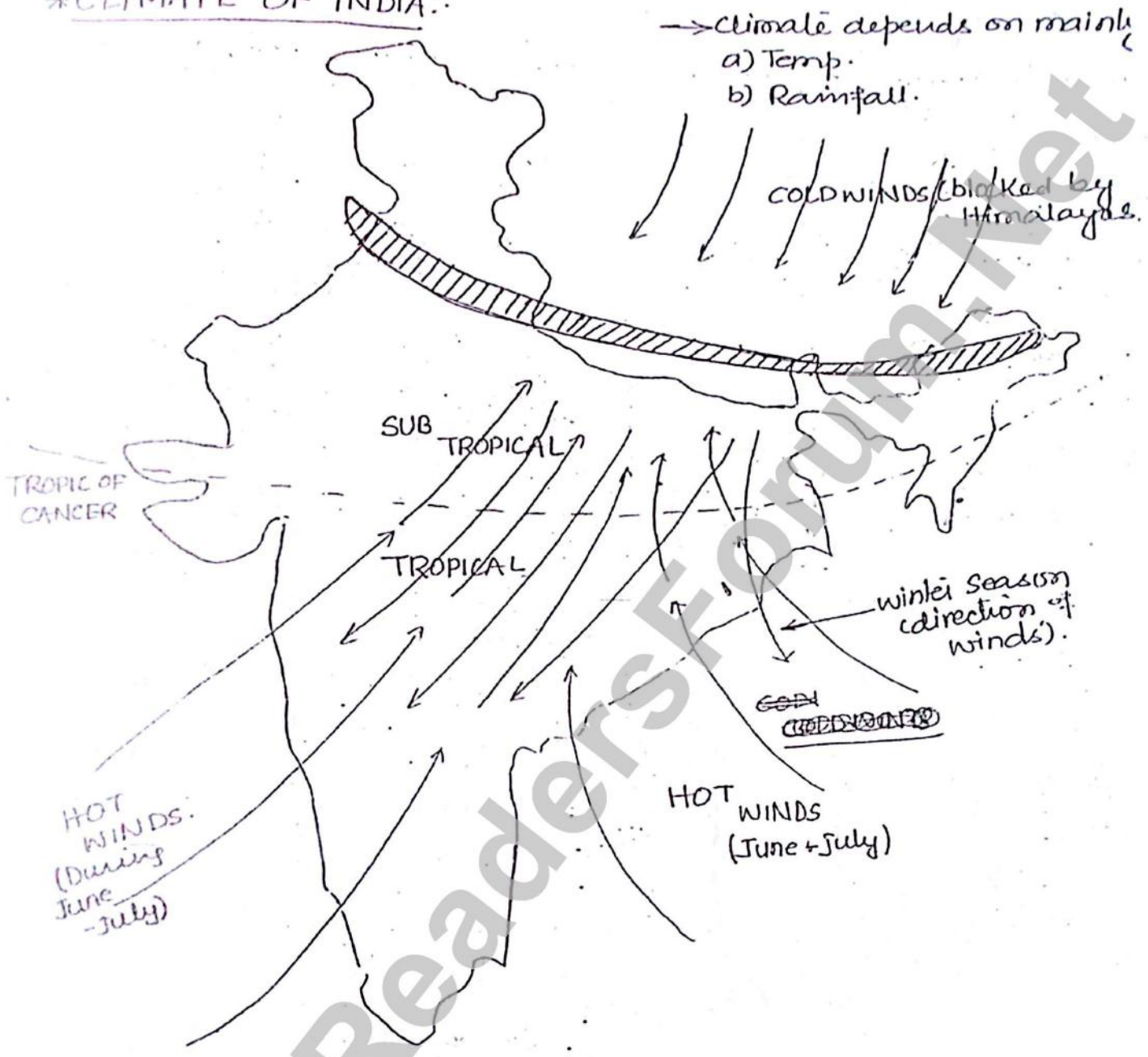
*CLIMATE OF INDIA:-



*OUR climate is TROPICAL (Indicator of Temp) MONSOON (Indicator of Rainfall.) Type climate.

*South of TROPIC OF CANCER; climate is TROPICAL (high temp)

North of " " " " " SUBTROPICAL (Relative low temp)

*MONSOON → RAIN → WINDS

(Seasonal Reversal of winds)

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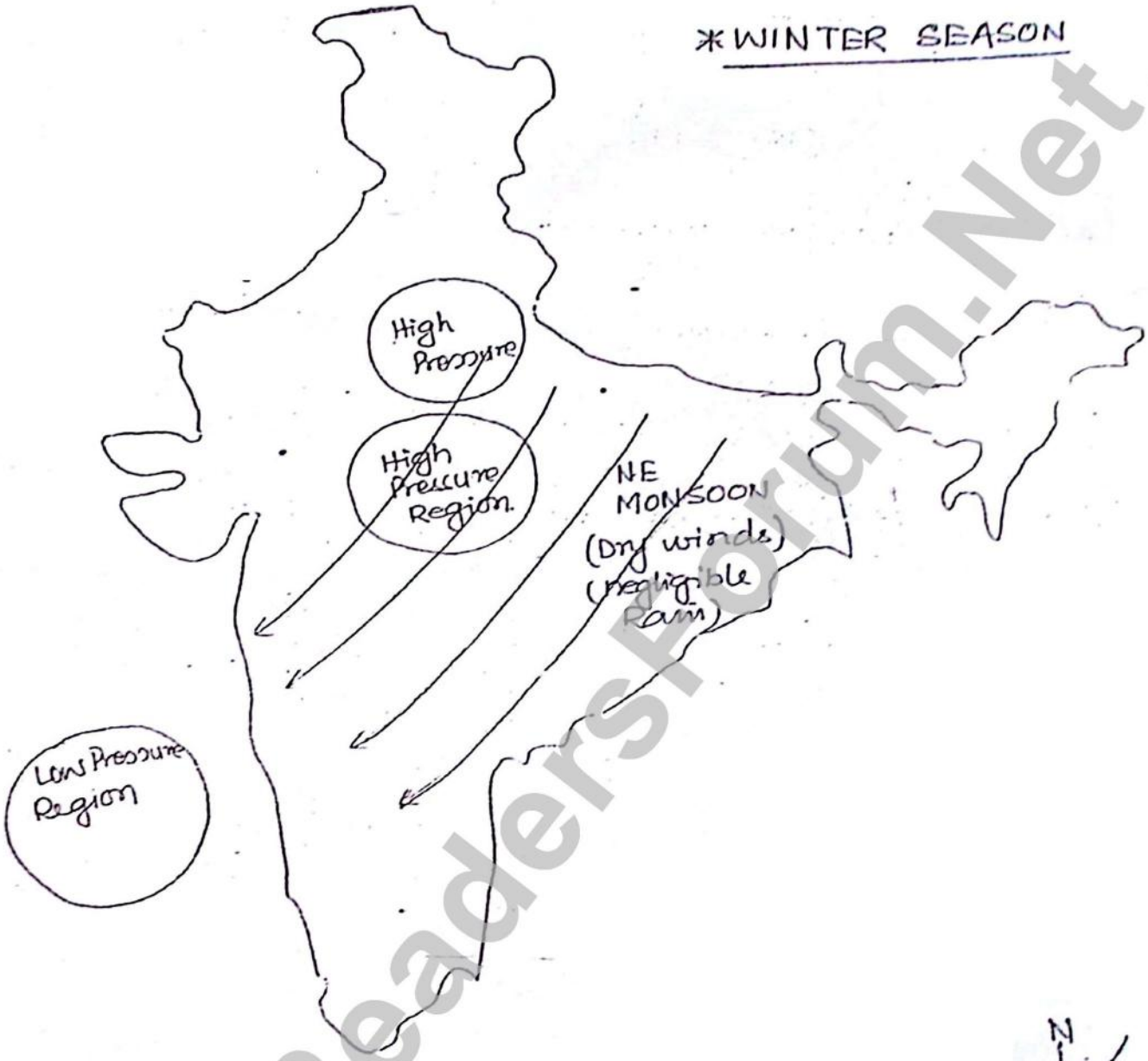
*WINTER SEASON



Temp α $\frac{1}{\text{Pressure}}$ (low temp means high pressure).

Sand (Rocks), easily heated up & easily cooled.

water, takes time to heat up & also to cool.

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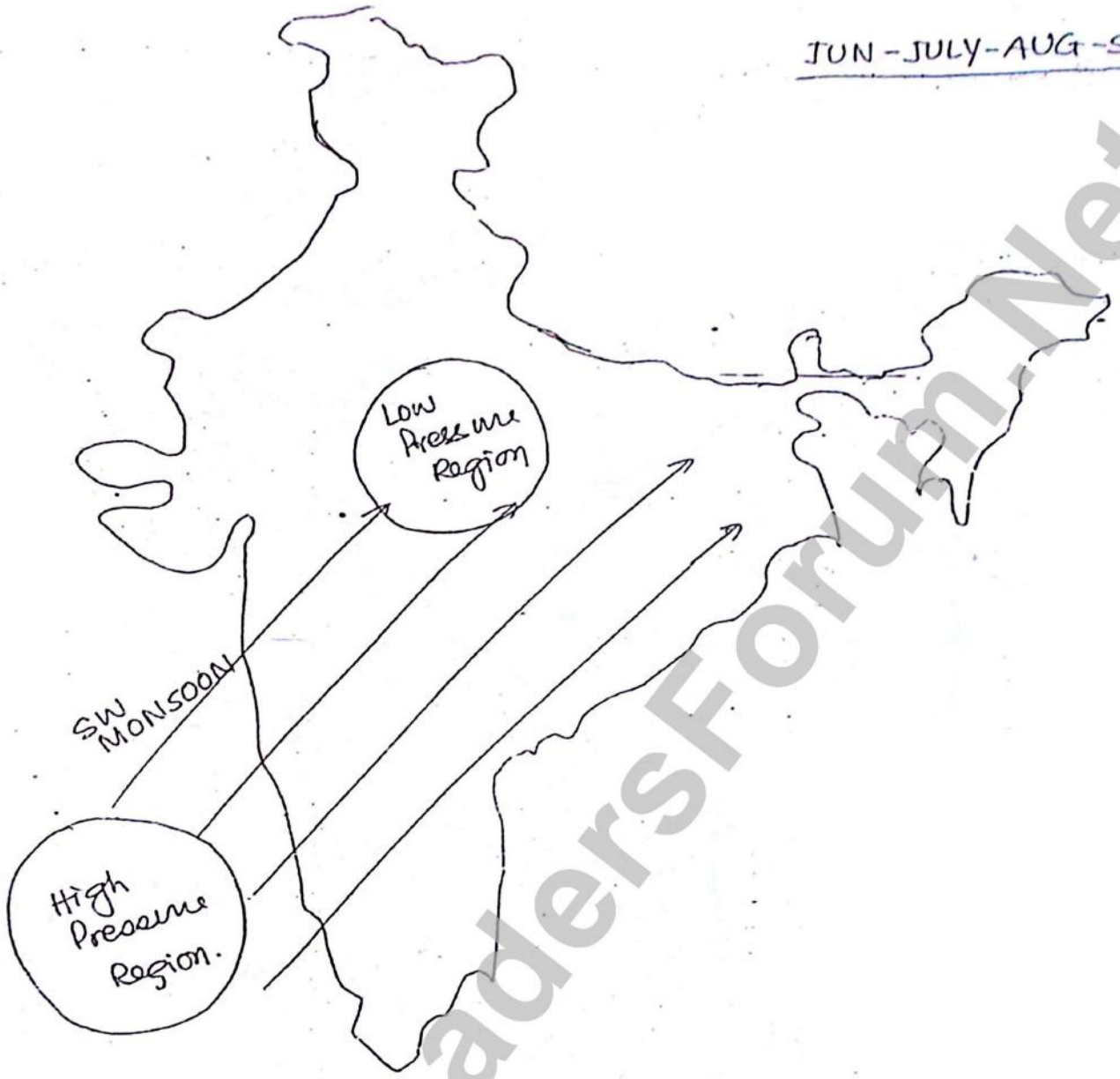

THERMAL CONCEPT: (old concept)

Seasonal Reversal occurs due to differential heating of LAND & OCEAN.

MODERN CONCEPT:

1. Role of TIBET PLATEAU.
2. Role of upper AIR CIRCULATION. (JET STREAM).

*JET STREAM was recognised during WW II.
* When USA (B-29 Plane) went to drop Atomic Bomb on Japan.
*Such JET STREAM run over India during WINTER SEASON only. (speed- 10/12 Km/hr).

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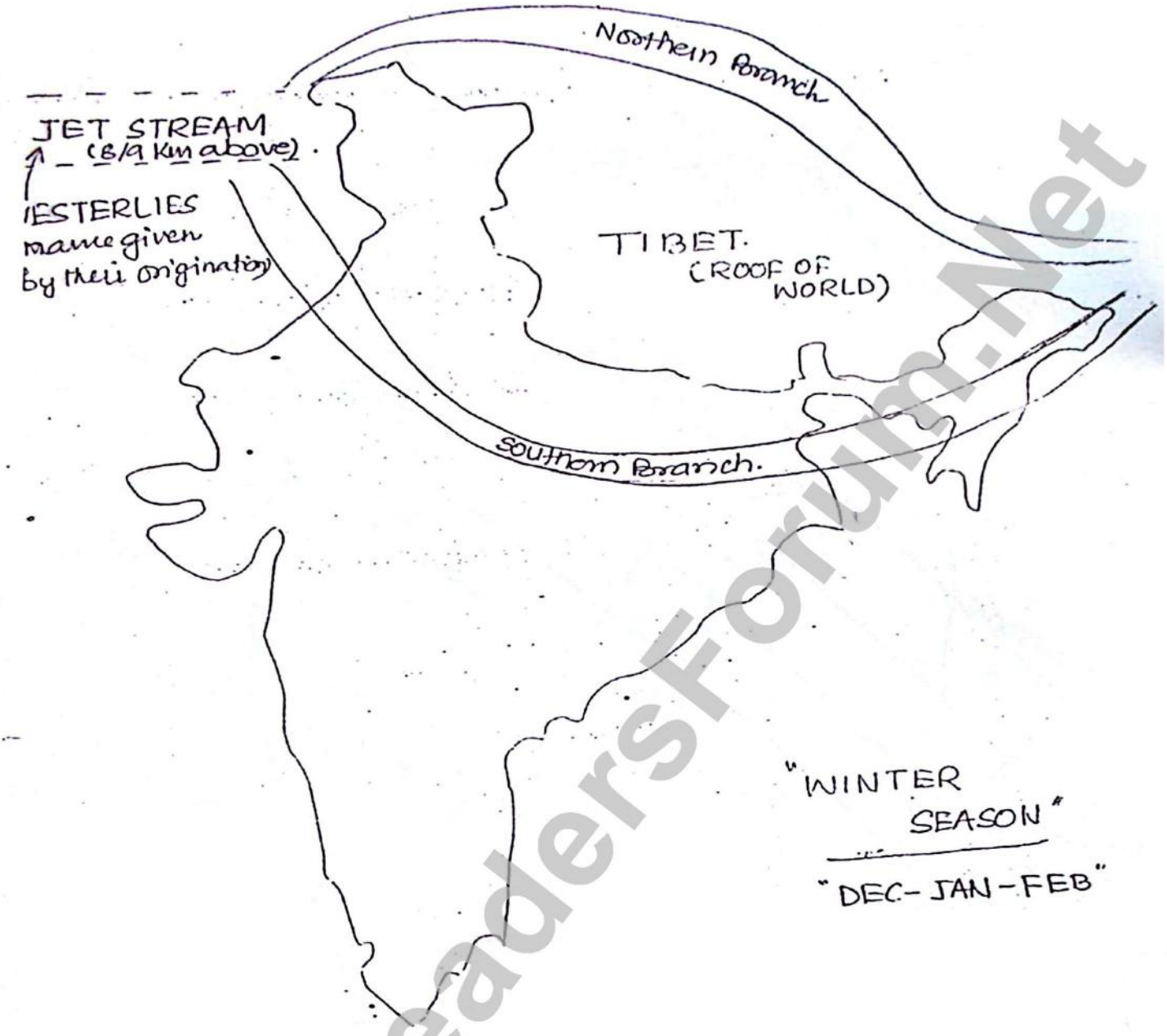

Jet stream on noticing Himalayas, can't cross that & bifurcates and moves in two parts.

As March, April approaches, sun is directly overhead and it hits the surface

During this, the ROOF (TIBETIAN PLATEAU) gets heated up which was once acting as cold body.

Due to this, the westerly Jet gets weak and shifts northward (as the temp Rises, then it shifts to more colder region)

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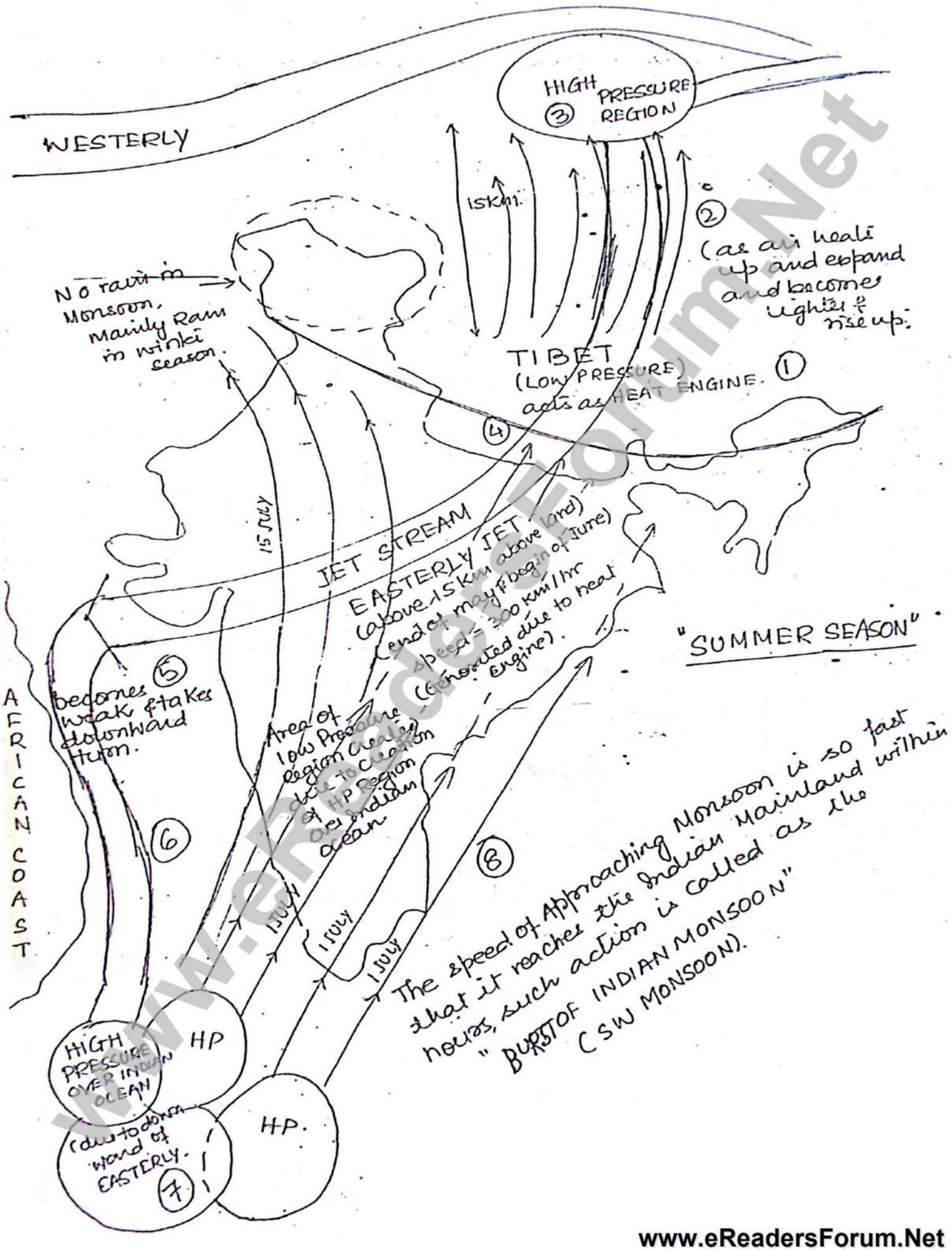
WESTERLY
HIGH PRESSURE REGION
③
15Km.
②
(as air heats up and expand and becomes lighter & rise up.
No rain in Monsoon, Mainly Rain in winter season.
TIBET (LOW PRESSURE) acts as HEAT ENGINE.
①
④
JET STREAM
EASTERLY JET (above 15Km above land) (end of may & begin of June) speed = 300 Km/hr (Generated due to heat engine).
15th July
"SUMMER SEASON"
AFRICAN COAST
⑤
becomes weak & takes Southward turn.
⑥
Area of low Pressure region created due to creation of HP Region over Indian ocean
1 JULY
1 JULY
1 JULY
⑧
The speed of Approaching Monsoon is so fast that it reaches the Indian Mainland within hours, such action is called as the "BURST OF INDIAN MONSOON" (SW MONSOON).
HIGH PRESSURE OVER INDIAN OCEAN
HP
(due to down ward of EASTERLY.
⑦
HP.

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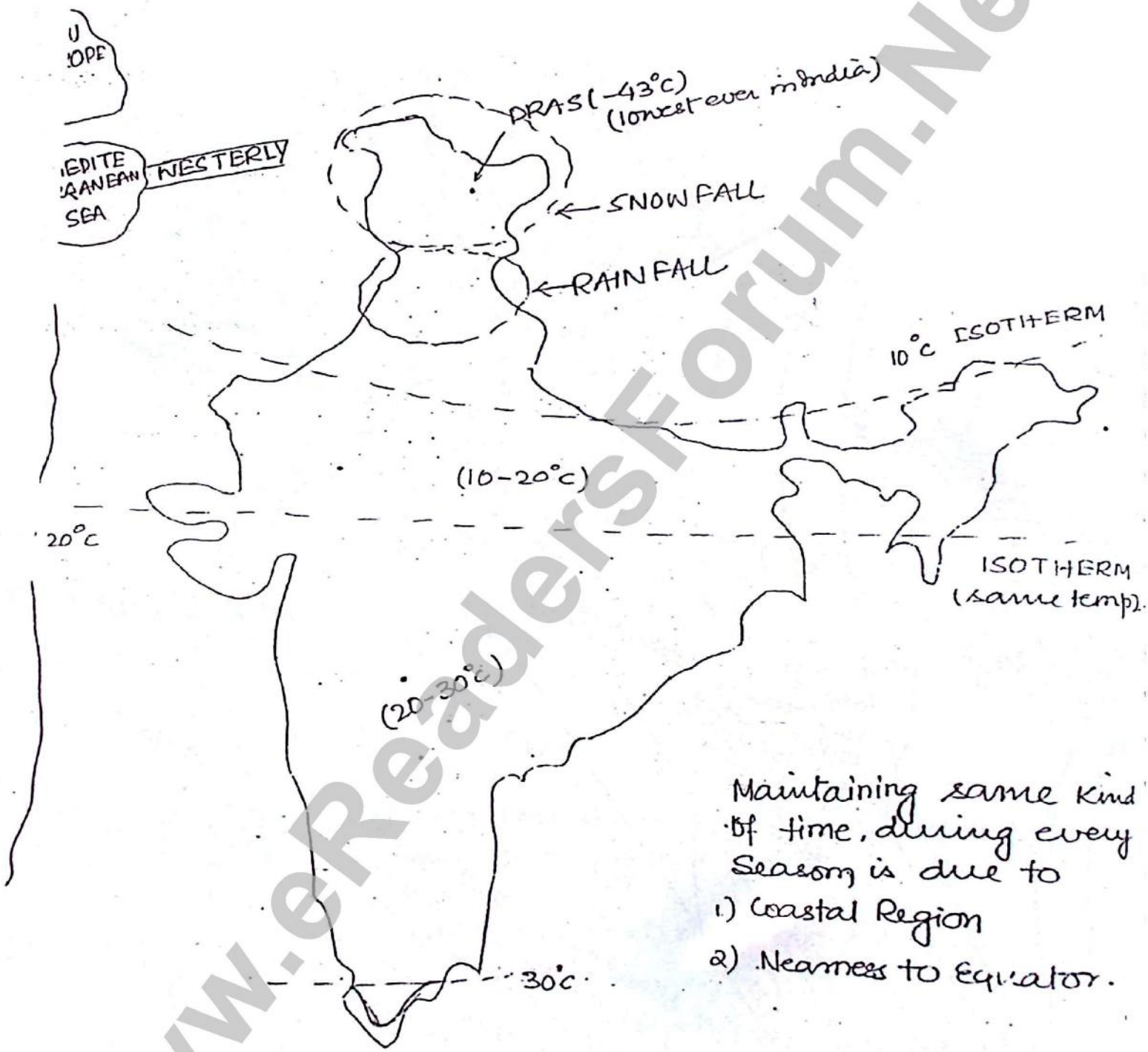
VINTER SEASON :.



Maintaining same kind of time, during every Season is due to

1) Coastal Region
2) Nearness to Equator.

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* Land colder, and Sea warmer, hence contains cloud. As westerly (fast Jet streams) drags up these clouds alongwith them and this is the reason of Rain in the J&K and Punjab Region.

* THESE are called as WESTERN DISTURBANCES
or
WESTERN DEPRESSION.
(low pressure areas – cloud formation

* low pressure – formation of cloud.
high pressure – no cloud.

* high temp → air warms up → becomes light
↓
Rises up (Ascending)
↓
condensation process
↓
formation of clouds.

* Importance of western Disturbances is for the WHEAT CROP.
* locally these Rainfall is called as MAVATH

*WESTERN DISTURDANCE :

Source — MEDITERRANEAN SEA
Carrier — WESTERLY JET.

SUMMER :

* March/April/May

* BRIYAWALI (BIKANER) → 54°C (In India)

* ALAZIZIA (LIBYA) → 58°C (In world).

* Air heats up & rises up, but no rain as air is completely dry and hence no formation of cloud.

* But, due to some reason, if air contain moistures, then cloud is formed as Rain occurs. Such is called as PREMONSO

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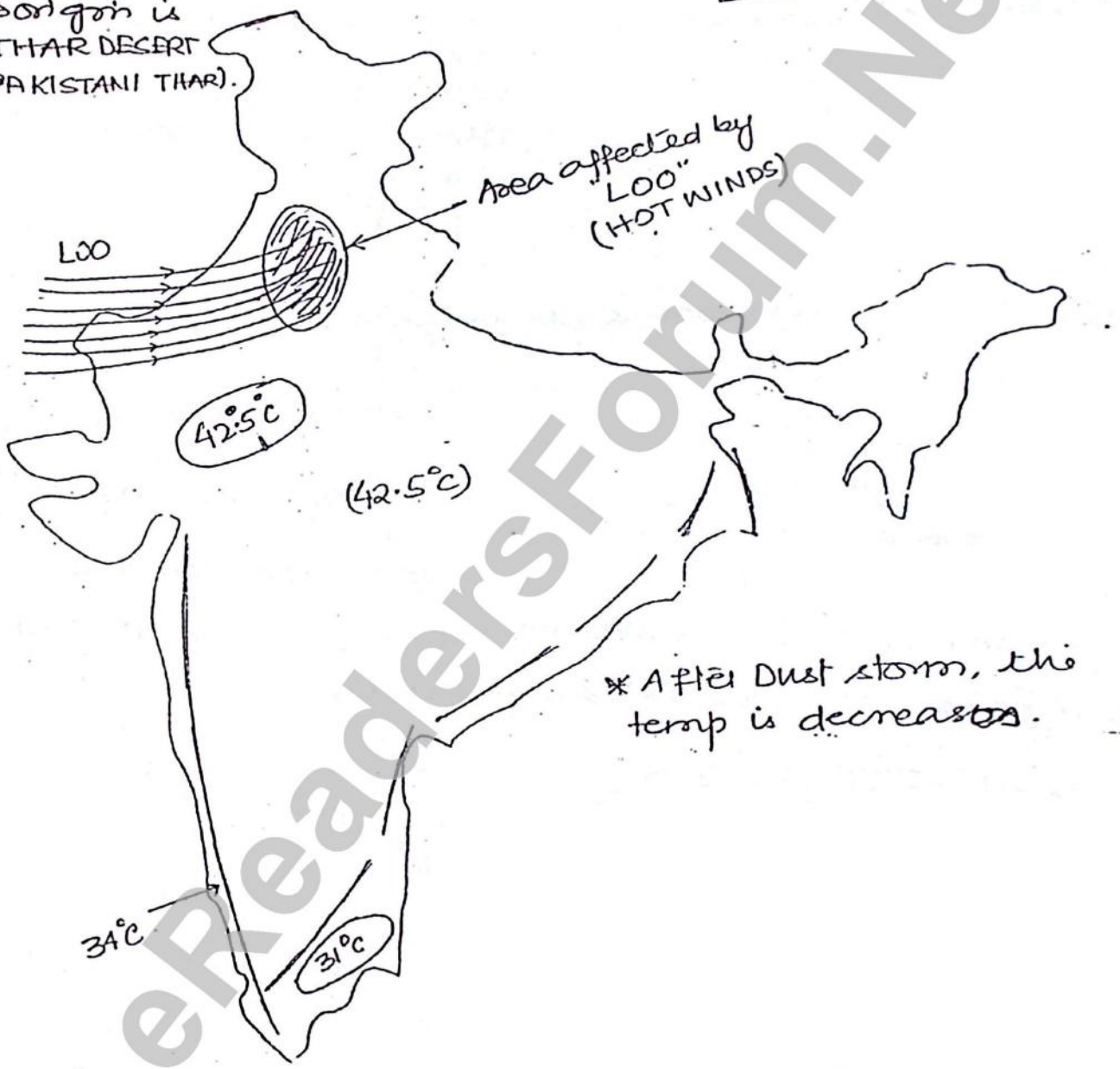
* In North East, WB, during the summer region if rain occur (Premonsoon), it is called as KAL BAISAKH (NORWESTER).

BIKANER
BRIYAWALI – 54°C

LOO → origin is THAR DESERT (PAKISTANI THAR).



* After Dust storm, the temp is decreases.

In South India, such pre monsoon is called as the "MANGO SHOWER", which helps in early Ripening of Mangoes

In Karnataka, it is called as "CHERRY BLOSSOM".

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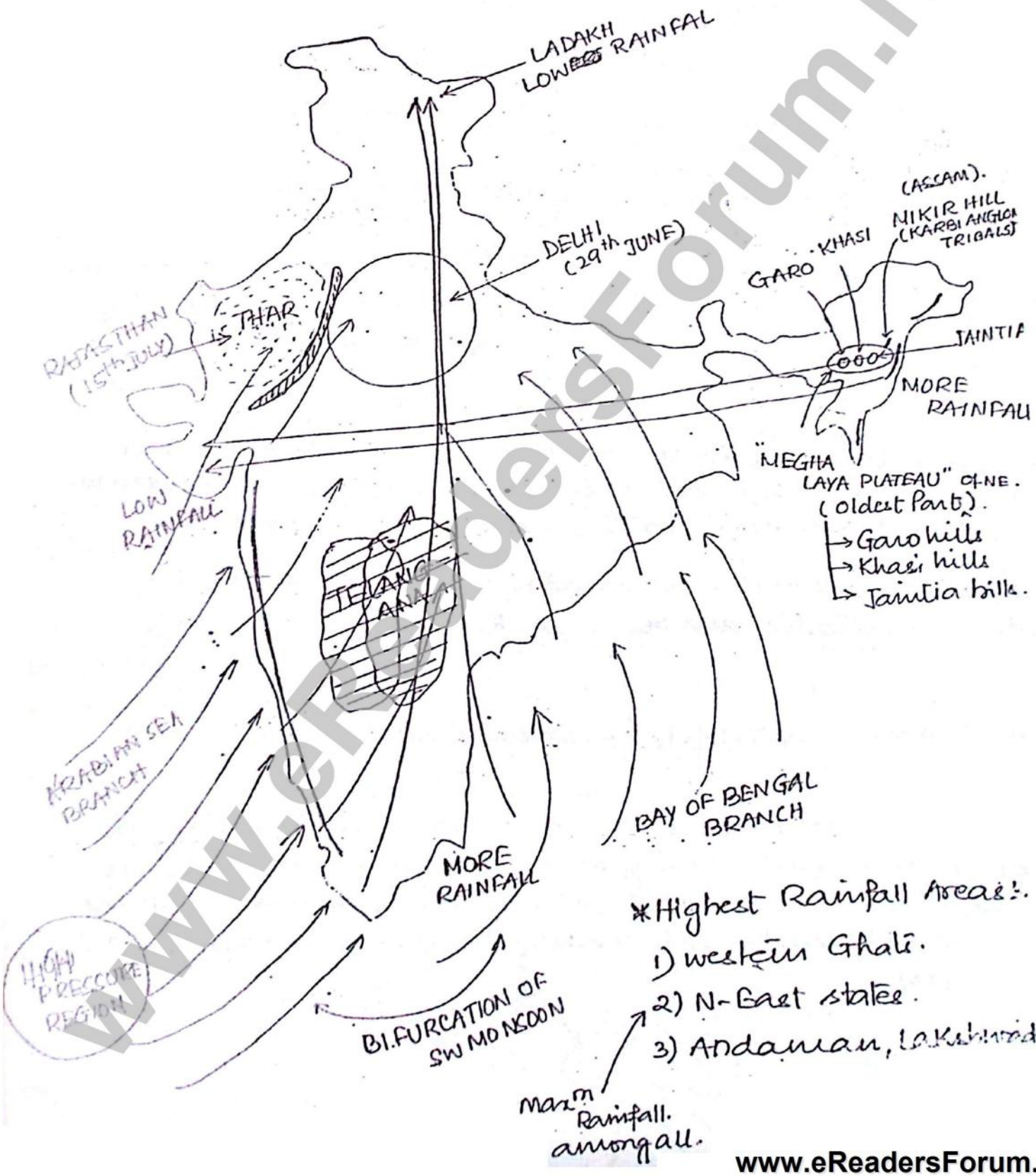
* RAINY SEASON:

* 1st June – Kerala Coast
  15 May – Andaman Coast.



* Highest Rainfall Areas:
  1) western Ghats.
  2) N-East states.
  3) Andaman, Lakshadweep

Max^m Rainfall among all.

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*low Rainfall Areas:-

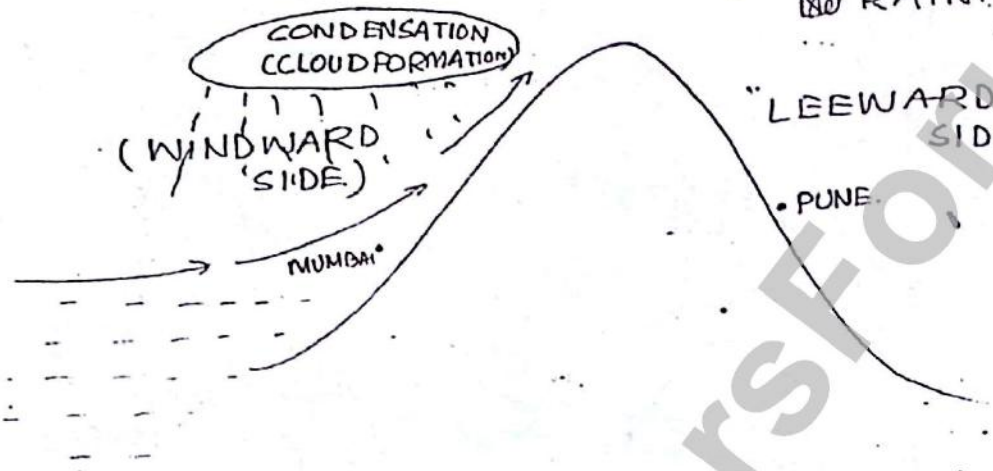
- Ladakh ← lowest Rainfall among all. (Driest place).
- Thar
- Telengana

Low rainfall area — leh.

effective dry area - Thar.

Western Ghats Recieving maxm Rainfall?

LESS. RAINFALL (comparatively)



"LEEWARD SIDE" or "RAINSHADOW SIDE".

Moisture laiden winds can't cross the hills, they rise up the mountain and becomes cooler and Condensation (Cloud formation) starts and hence Rain occurs.

TELANGANA lies to the leeward side of hill, hence it recieves negligible amount of Rainfall.

Ex:-

MIKIR HILL — ASSAM → Tribals "KARBI ANGLONG".

The Bay of Bengal Branch of SW monsoon, on noticing no barriers in their path easily enters into the N-EAST. And as soon as these moist winds, enters these areas, notices a huge no. of hills, ultimately they are trapped and causes RAIN.

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*The trapping of these winds are more in the centre and that too around KHASI HILLS.

4 months (JUN-JUL-AUG-SEP) → MAWSYNRAM (1100 cm).

2nd Rainiest place in world → CHERRAPUNJI

1) LORO → COLUMBIA (1300cm) (all 12 months)

* Measured through RAINGAUGE.

*LOW Rainfall in THAR:.

*ARAVALI running parallel to the ARABIAN SEA branch of the SW MONSOON.

*Main cause is that the Aravali is parallel to the monsoon winds.

* Another branch (Bay of Bengal), as reaches to the Raj. area, the moisture content is no more and hence no Rainfall.

ANNUAL RAINFALL — 25cm.

*To crown any place a Desert, the Rainfall should be less than 25 cm.

* DESERT

↓ HOT (THAR) due to proximity to Equator

↓ COLD (LADAKH) (due to more height; ie himalayas).

less Rainfall (<25cm) to be crowned as DESERT.

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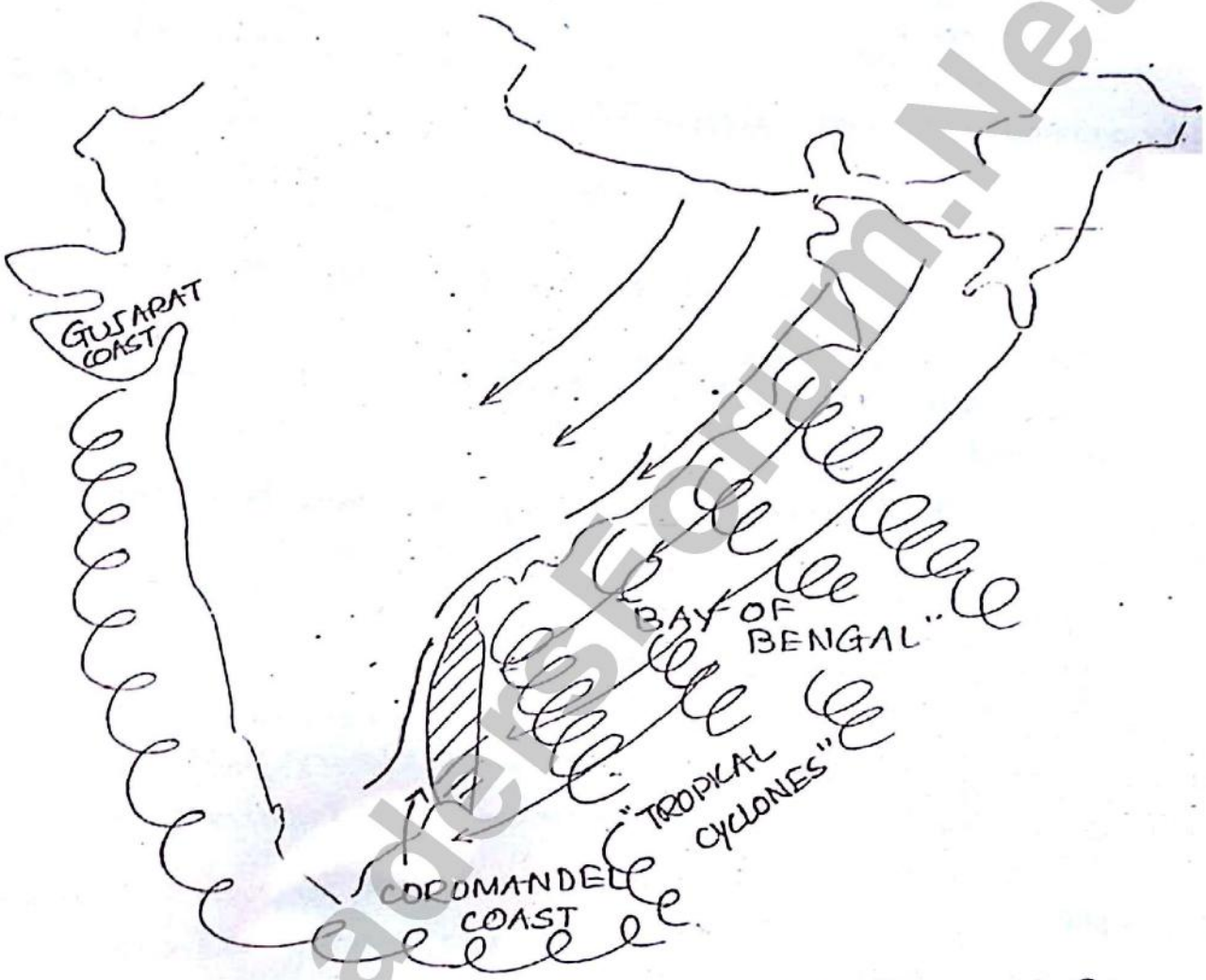
NOTE:

:SW monsoon after the months of JUN-JULY-AUG-SEP.

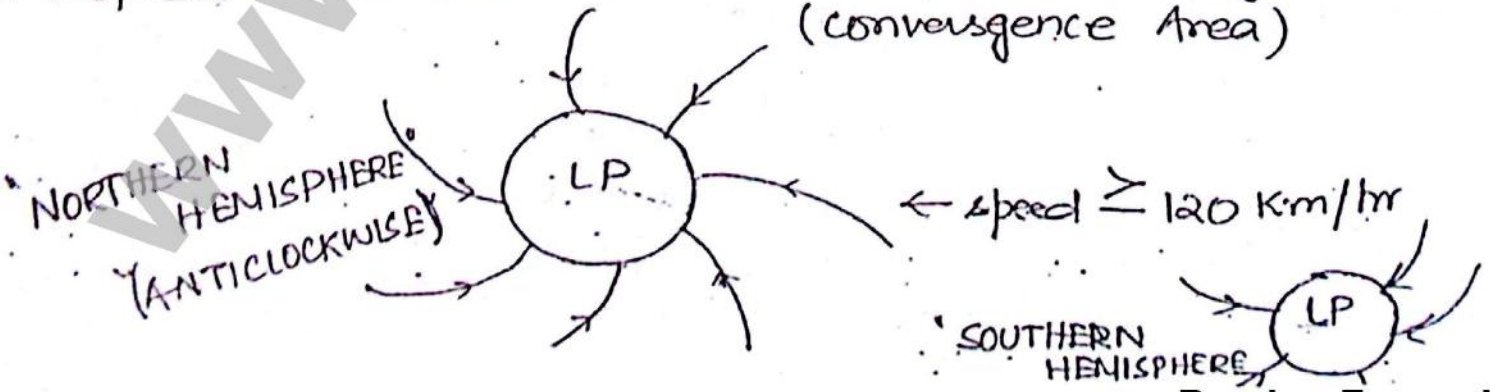
:These are replaced by NE monsoon during OCT-NOV.



The Retreating monsoon as passes over Bay of Bengal gains moisture and it is shedded over the COROMANDEL COAST only.

TROPICAL CYCLONES?: (during OCT & NOV - over TN, ANDHRA, ORISSA

* Tropical — hot condition — low pressure Region (convergence Area)



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* These cyclones generals over warm ocean area (27°C) hence huge rainfall.

initial conc (can be goe to generali cyclone.

* Damage to the coastal Area:-
  1) high speed wind.
  2) sea wali rushes to the land.
  3) Heavy Rainfall.

* on Eastern Side, stales under effect
  a) T.N.
  b) Andhra.
  c) odisha
  d) WB.

* on western side, stali under effect is Gujarat.

* Names given to the cyclones are:-
  1) LAILA
  2) AILA
  3) GOLU
  4) BHOLA
  5) NARGIS

* BAY OF BENGAL — River draining more fresh wali (more fresh wali content
  ARABIAN SEA — less River draining (more saline

* B.O.B. easily gets healed up (as more fresh wali

* Cyclone given different names in other countries:-
  1) TYPHOON — CHINA, JAPAN
  2) HURRICANE — USA, WEST-INDIES
     - KATRINA
     - ANDREWS
     - CHARLIE
  3) WILLY WILLIES — AUSTRALIA

} "TROPICAL CYCLONES"

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:SOILS OF INDIA:-

Soil - uppermost layer of Earth.

- organic content
- Inorganic content.

Fundamental reasons for making of Soil are:-

a) climate.
b) Topography.

- Soil - thin, along mountains.
  - thick, along plains.

- Indian Soil is divided into 8 types by Indian Council for Agricultural Research (New Delhi).

a) ALLUVIAL (Most Fertile) (largest area content)
b) BLACK
c) RED.
d) LATERITE
e) SANDY/ARID SOIL.
f) MOUNTAIN SOIL
g) PEATY SOIL (COAL RICH)
h) SALINE SOIL (least fertile) (least area content).
(Infertile Soil).

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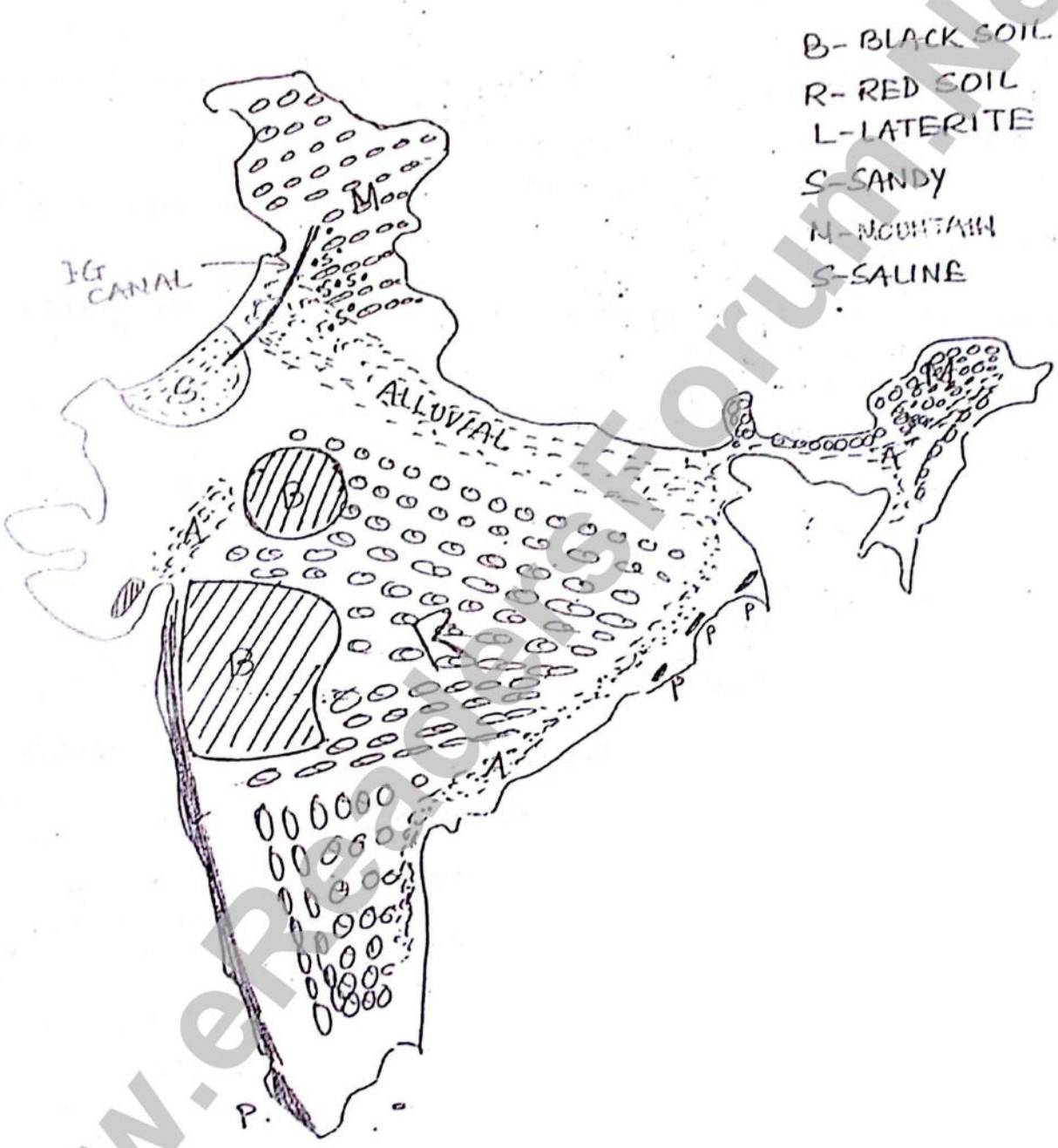
ALLUVIAL:
*Alluvial- Transported soil & young soil.
↳Internationally called as ENTISOL
↳ EMBRYO.

* Alluvial soil is lacking in NITROGEN"/addition of UREA ($(NH_2)_2CO$) to increase N_2 content
(Thick Soil).



*BLACK SOIL: ←Chemically Fe_3O_4. (more iron content)
* Black — BASALT / content of Magnetite.
*Basalt crystal is thin and hence, if any rainfall occurs, it gets trapped in these pores and has HIGH MOISTURE CONTENT
RAIN.

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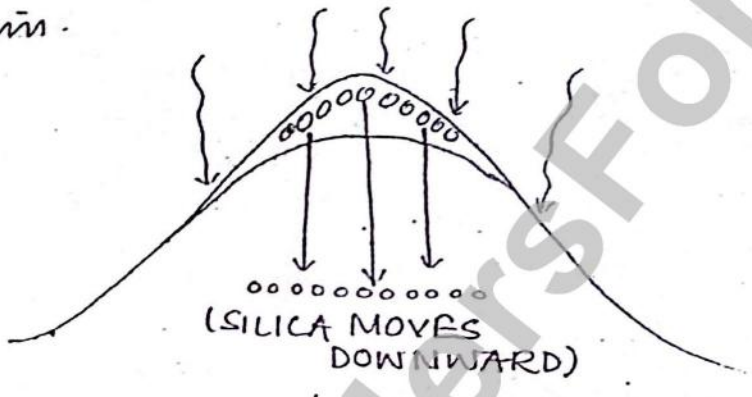
* COTTON is the most suited CROP.
: In Maharashtra, it is locally called as "REGUR".

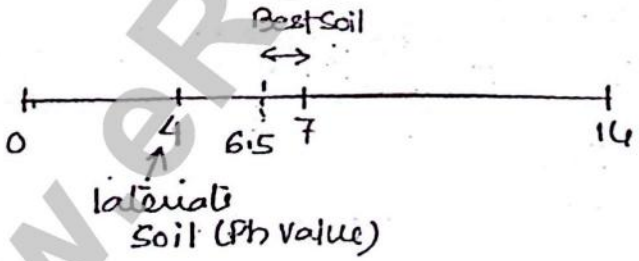
During summer season, the moisture goes up and develop "CRACKS IN IT"

RED SOIL: (Chemically - Fe_2O_3 - less iron content than BLACK)
: Red colour due to iron content

LATERITE SOIL:
Found in western Ghats, characteristic is more rainfall & high Rain.



* Downward movement of Nutrients is called "LEACHING".
* LATERITE SOIL is formed by LEACHING
* Soil becomes slightly Acidic in nature.



* RICE, COFFEE, TEA, COCONUT, → these crops are grown as they can sustain Acidity of Soil.

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*SANDY SOIL:-

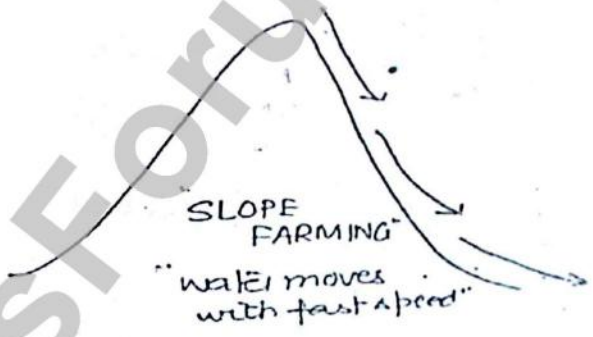
*Moisture content is less, if provided it will be more fertile than ALLUVIAL.

*MOUNTAIN SOIL:-

*Generally, not cultivated, as the soil is thin and once eroded, it will take 1000 of years to form.

*Forest Regions are mainly found.

*For cultivation, step or TERRACE FARMING is done.



*PEATY SOIL:-

*Found in Kerala, Sunderban delta, Odisha

* crops are:-
  i) Rice
  ii) Jute

* Max^m organic content in these soil.
* Moisture content is also high.

*SALINE :-

*Infertile soil due to high Sodium content.

*Found in distributed manner.

*Infertile due to human Act, due to large amount of CANAL IRRIGATION.

As farmers leave the land, drowned with these canal water and hence, the water percolates down and the land becomes saturated.

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*during Summer season, the moisture of soil gets evaporated and along with these moisture salts (mainly Sodium) comes up and gets deposited on the surface

*This process is called "CAPILLARY ACTION"

: These soil are characterised by "WHITE PATCHES"

locally these patches are called as "REH" or "USAR".

To retrieve back the soil "GYPSUM" is added to the soil to reduce the salinity of soil.

SOIL EROSION :-

*Removal of upper portion of soil is called soil Erosion.

*Depending upon their intensity, categorised as:-

a) SHEET EROSION (mildest form).
b) RILL "
c) GULLY "
d) RAVINE / BADLAND (extreme form).

a)

b)

c)

d)

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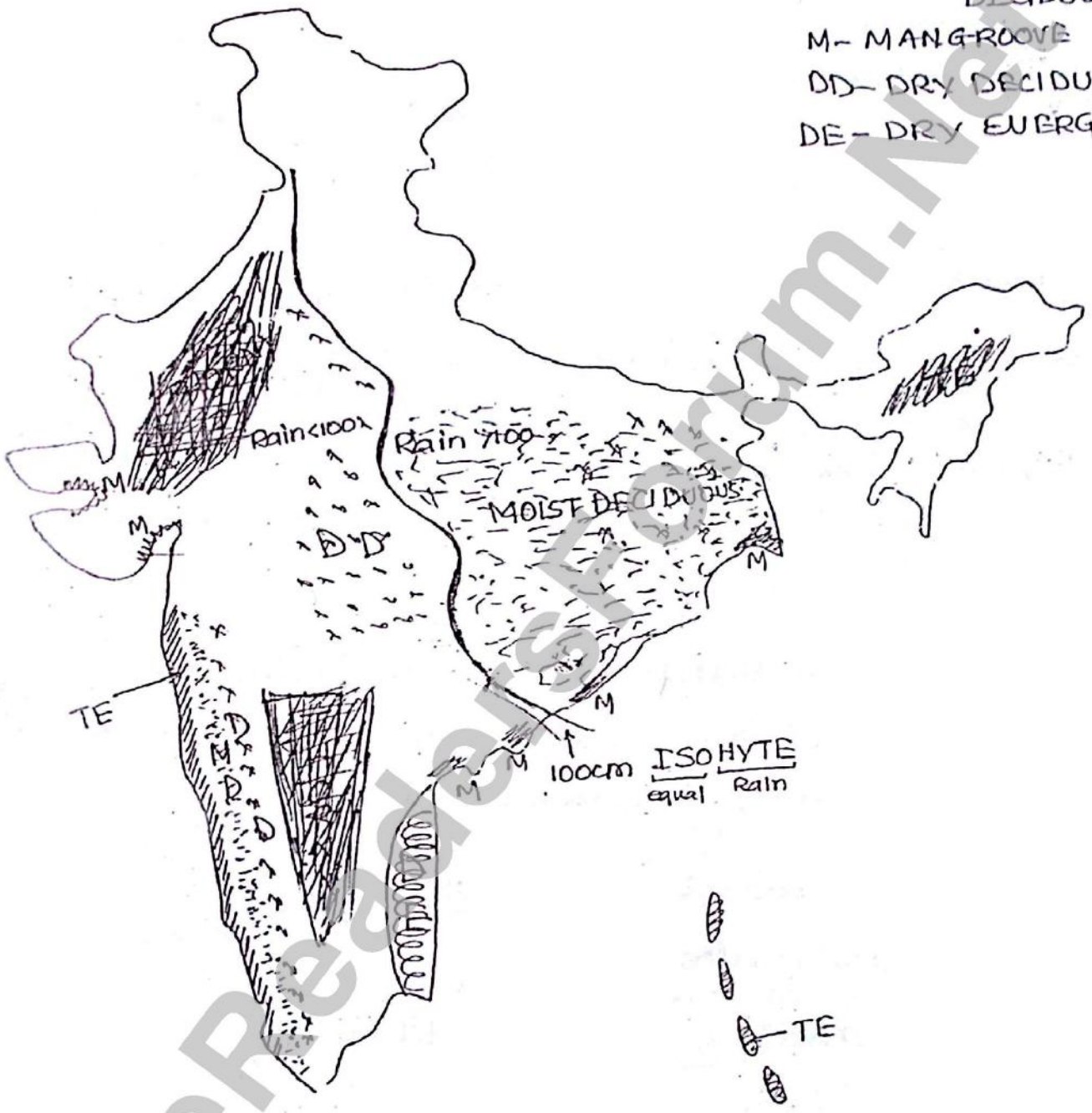
* FORESTS / NATURAL VEGETATION:-

TE - TROPICAL EVERGREEN
MD - MOIST DECIDUOUS
M - MANGROOVE
DD - DRY DECIDUOU
DE - DRY EVERGREE



Mainly our forests are basically DECIDUOUS FORESTS.
(Trees shed their leaves to avoid harsh summer condn.

* largest Forest Reserve states : (Area wise).
1) M.P
2) Arunachal
3) Chattisgarh

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% Coverage of Forest of any state, the ranking is:

1) Mizoram (90% cover).
2) Nagaland.
3) Andaman & Lakshwadweep.

least area under forest:

1) Haryana.
2) Punjab.

largest forest area (areawise)

a) RUSSIA (SOFTWOOD/CONIFEROUS ↑ (conical shape) Eg: Pine, fir
b) BRAZIL (HARDWOOD/ BROADLEAVED EVERGREEN
Eg: Ebony, Mahogany Rosewood.

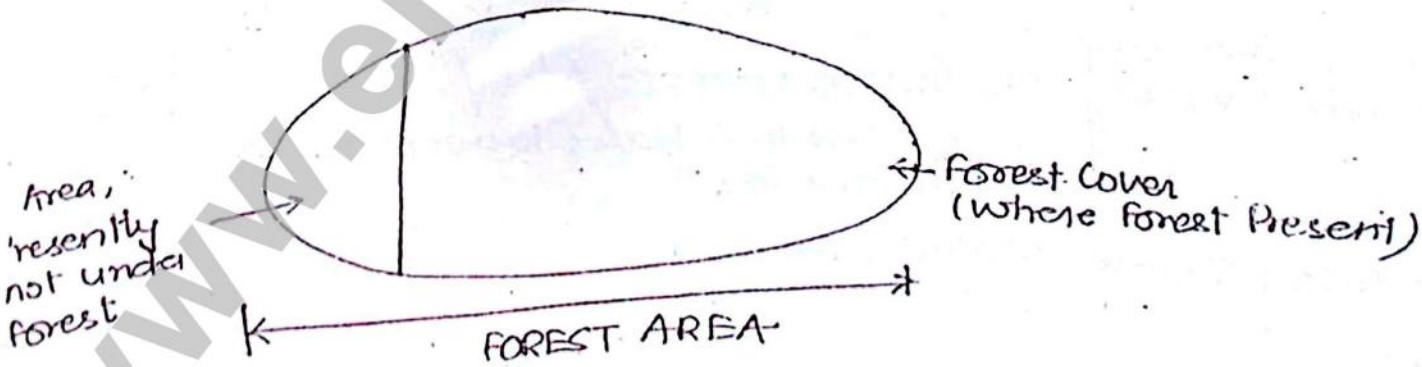
Maxm no. of trees that are found in India are:

1) SAL (Gregrious in nature), shivalik, Jh, CG, MP.
2) TEAK (Sagwan). (Jharkhand, CG, MP).

Around 21.02% of India is under FOREST COVER.

Forest Area in India is about 23%.

FOREST DATA is made by "NATIONAL REMOTE SENSING CENTRE" - HYD.



Ecologically balanced — 33% should be under forest

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* Plain — about 25% area under forest
* Mountain — more than 60% under forest
* Above is valid to maintain Ecologically balanced.
* FOREST can be subdirided as:.

- TROPICAL MOIST (>100cm)
- TROPICAL DRY (≤ (≈100cm))
  - Temperature const
  - Rain variable
- MOUNTAIN FOREST (MONTANE VEGETATION)
  - dependent on Temp.

* TROPICAL MOIST (Rain >100cm):.

- TROPICAL EVERGREEN (Rain >200cm)
- TROPICAL MOIST DECIDUOUS (200< Rain <100) (1st- Area content in India)
- MANGROOVE/TIDAL FOREST (Rain >100)

Moist Deciduous!.

Imp. Trees are!.

1) SAL
2) TEAK
3) SANDALWOOD

Tropical Evergreen

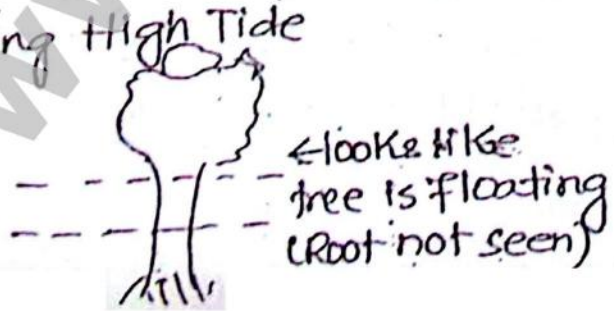
Imp. Trees are!.

1) Ebony
2) Mahogany
3) Rosewood.
4) Bamboo
5) Gurjan.

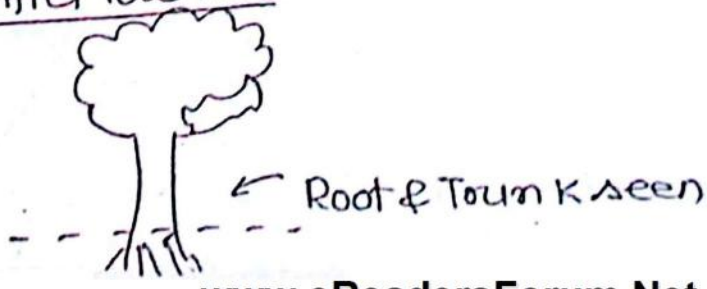
Mangroove!

Salt Resistant Trees are found here

* These tree are strong and flexible
* During High Tide



After low tide!.



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* Importance is that, these MANGROOVES provide security to the coastal Areas from "CYCLONES".

* Imp. Trees are:-

1) SUNDARI

* TROPICAL DRY FOREST (Rain <100cm):-

- TROPICAL DRY DECIDUOUS
- TROPICAL DRY EVERGREEN (2nd - Area covered in India)
- TROPICAL THORNY

Dry Deciduous

1) spacing b/w trees is more.
2) Neem
3) Mango
4) Khair

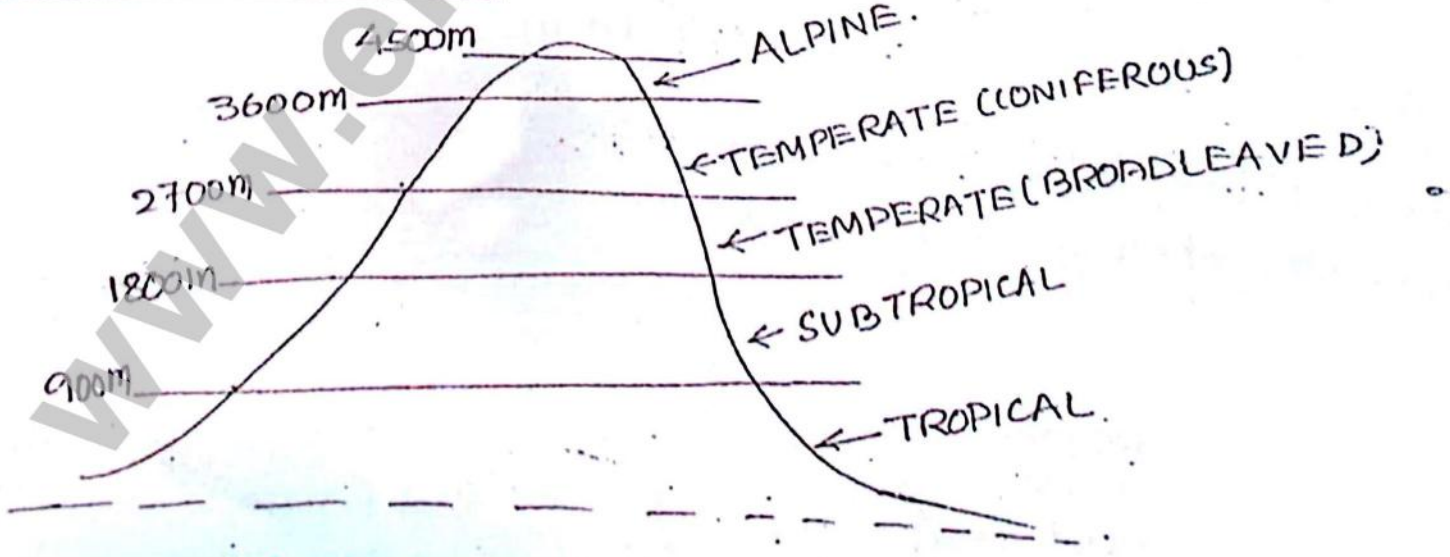
Dry Evergreen:-

1) TAMARIND.

Thorny:-

1) CACTUS
2) KHEJRI
3) BABOOL
4) BER
5) KEEKAL

MOUNTAIN FOREST



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*2700 m — Temperate (BROADLEAVED)
(low temp.)

Eg: OAK, CHESTNUT, APPLE

*3600 m — Temperate (CONIFEROUS).
(Typical montane variety)

Eg: PINE, SPRUCE, FIR
DEODAR (western Himalayas).

*4500 m — ALPINE
(very low temp).

Eg: LICHENS, MOSS, BUGYAL (soft grass).

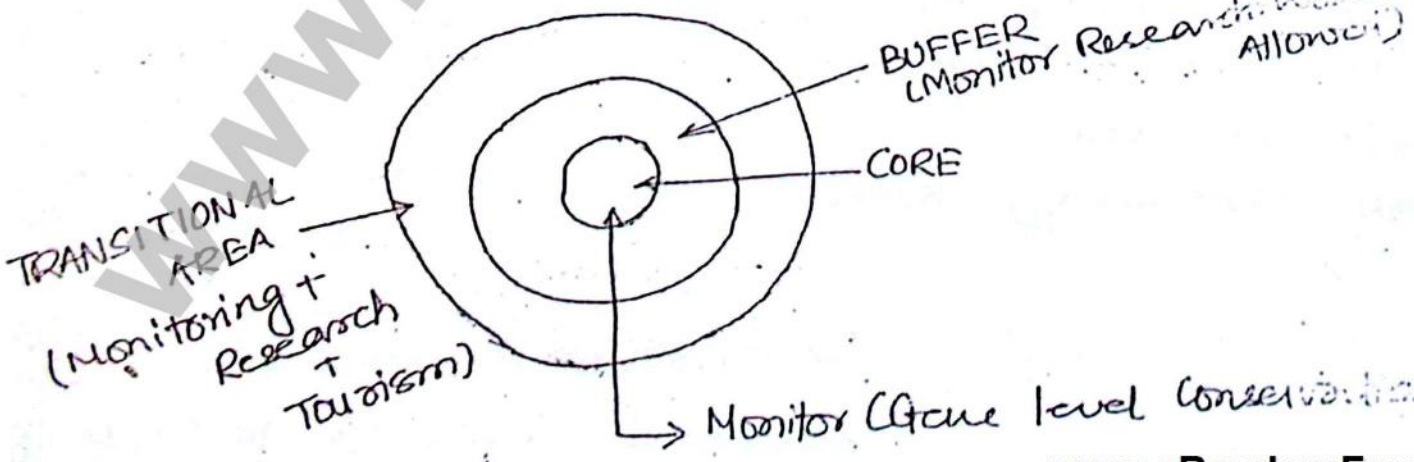
*WILD LIFE IN INDIA:

1970 — Protection of wild animal stats
1972 — Wildlife Protection Act

Wildlife Sanctuary: Total human interference } Human are allowed.
Around 550 in number

National Park: Restricted as compared to above (wildlife)
About 100 in number. (Human allowed but with Permission)

Biosphere Reserve: No human interference
Total 17 in India.



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BIODIVERSITY AREAS:

1) NILGIRI (Western Coast)
2) NANDA DEVI (Himalayas).
3) SUNDARBAN (Delta)
4) GULF OF MANNAR (Marine Biosphere Reserve).
5) NOKREK (Meghalaya).
6) PACHMARHI (MP)
7) ODISHA
8) SHESHACHALAM (Andhra) ← Added Recently
9) COLD DESERT – Himachal.
0) RANN OF KACHCH (largest).

IATIONAL PARK:

1. JIM CORBETT (1936)
   → Nainital, Garhwal)
   → First in India, Uttarakhand)

) Highest no. of Parks in MP & Andaman & Nicobar.

amous Parks:

) Valley of Flowers – Uttarakhand.
2) DUDHWA – Uttar Pradesh.
) KANHA – M.P
) RANTHAMBOR – Rajasthan
NANDAN KANHA – Odisha (White Tiger)
) INDRAWATI – Chattisgarh.
1 BANDIPUR – Karnataka.
1 KAJIRANGA – Assam.
) PERIYAR (Silent valley) – Kerala.

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Animals	National Parks
1) Lion	Gir (Gujarat)
2) Tiger	Kajiranga (Assam) (39 areas have tiger Reserve)
*Karnataka - has max tigers.	
3) One horned Rhino	Kaziranga (MANAS - Biosphere Region)
4) HANGUL	Dachigam (J&K)
5) Giant Turtle (OLIVE RIDLEY)	Gahirmatha (Odisha)
6) Red Panda	Namdapha National Park (DIHANG - DEBANG Biosphere) (Arunachal Pradesh)
7) Black Buck (Kali Hiran)	Churu, Bikaner (Rajasthan) BISNOI (Protecting them).
8) crocodile	Chambal Sanctuary (Raj, MP, UP)
9) Lion Tailed Macaque	Eravikullam National Park (Kerala).

*Floating National Park - Keibul (LAMJAO) — in LOKTAK LAKE (Manipur).

*PROJECTS RELATED TO WILDLIFE:

1) Project Tiger ——→ 1973
2) Crocodile ——→ 1975
3) one horn Rhino ——→ 1987
4) Elephant ——→ 1992
5) Snow leopard ——→ 2009

*39 tiger reserves are in India (most in MP)
* Highest no. of tigers is in Karnataka.

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: Kaziranga has maxm no. of tigers as a national Park.
3 Projects are about to be approved. They are provisional.

: ELEPHANT

: maxm no. of Elephants is in South India
2nd is in North East
3rd is in Shivaliks.

worldwide:-

SRENEGETTI NATIONAL PARK ⟶ TANZANIA, KENYA (Africa).

YELLOWSTONE NATIONAL PARK ⟶ USA

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Note:-
1) Mineral Resources.
2) Agriculture
3) Transportation
4) Industries
The above are called as the "ECONOMIC GEOGRAPHY OF INDIA".

* MINERAL RESOURCES OF INDIA:-

1) Energy Resources.
2) Metallic Resources.
3) Non-metallic Resources.

* ENERGY RESOURCES:-

The Energy Resources comprises of:
a) COAL (Major in India.
b) Petroleum
c) Natural Gas.

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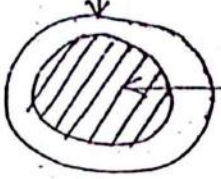
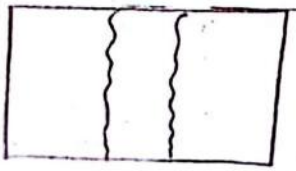
COAL:

* 150 million years ago
↓
At Goondwana land.
↓



MAGMA { very hot and it is possible break rocks upto 3000°C }.



← Due to this, trees of forests collapsed made Hill and due to low lying areas, water filled into these areas and decomposition started and after a long time it finally converted into "COAL".

* Due to this periodic change, this coal is called as "GONDWANA COAL".

Coal is further divided as following:

1) ANTHRACITE (80-95% Coal).
2) BITUMINOUS (60-80% - Mostly in India).
3) LIGNITE (40-60%)
4) PEAT — <(40%)

Mainly in the valley of DAMODAR, MAHANADI, SON & GODAVARI

BITUMINOUS COAL:

* In DAMODAR valley
⇓
JHARKHAND
⇓
DHANBAD
⇓
1) JHARIA (Largest Coal Mine in India)

2) BOKARO
3) KARNPURA
4) GIRIDIH
5) RAMGARH

} All in Jharkhand

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*oldest Coal Mine in India is RANIGANJ (WB).

* TALCHER – ODISHA
* KORBA – CHATTISGARH } MAHANADI
* SINGRAULI – MP
* SINGRAINI – ANDHRA ← GODAVARI

* Max^m production of Coal – Chattisgarh.
* Max^m Area Reserve – Jharkhand.

*COAL PRODUCTION IN WORLD :-

1) CHINA.
2) USA
3) INDIA.

* COAL RESERVE AREA :-

1) USA
2) RUSSIA
3) CHINA
4) AUSTRALIA.
5) INDIA.

*LIGNITE COAL MINE :- (younger than Bituminous)

1) NEYVELI – Tamil Nadu (NO. 1 in lignite).
2) PALANA – BIKANER (Rajasthan)

* ANTHRACITE is oldest coal (Best Coal)
* PEAT is the youngest coal (worst coal).

* Coal mines in North East :-

1) MAKUM (Assam)
2) NAMCHIK NAMPHUK (Arunachal Pradesh). } Tertiary coal mines

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Use of Coal:-

) Thermal Power (Bad quality coal also accepted) (NTPC – more pollution)
) Steel Plants (Good quality coal only)

· Coal Mining is very risky.
· Major causes of risk are:-
1) Fire (due to Methane)
2) Poisonous gases.
3) Flood.
4) collapse of Roof.

· JHARIA has more accidents due to this JHARIA is sinking in Coal Mining

CHINA have maxm no. of accidents in coal mining – due to higher coal production in the world.

:PETROLEUM:-

It is dense in only some countries and whole world depends upon them.

: India – 80% Import.
20% Domestic.

Petroleum is marine Fossil
* It is found near Coastal Areas.

1st petroleum found in India in DIGBOI (Assam)
GUJRAT state producing maxm Petroleum, second is ASSAM.
MUMBAI (BOMBAY) HIGH is not considered in Maharashtra, it is governed by central (Maxm production, 60% of total petroleum of India).
and highest discovery in India).
CAIRN INDIA, part of CAIRN ENERGY (U.K) found a large petroleum area (BARMER, Rajasthan) – THAR AREA

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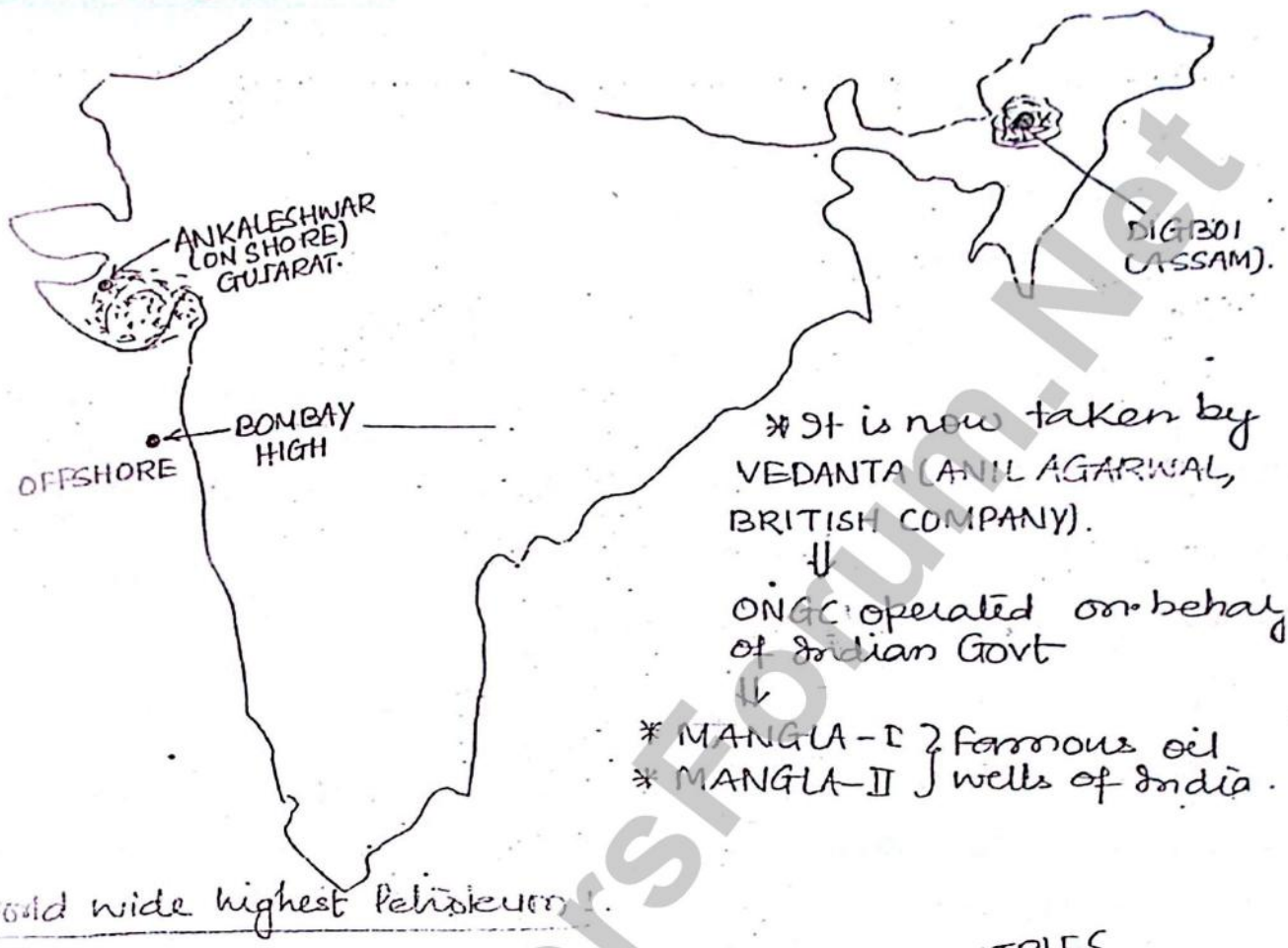
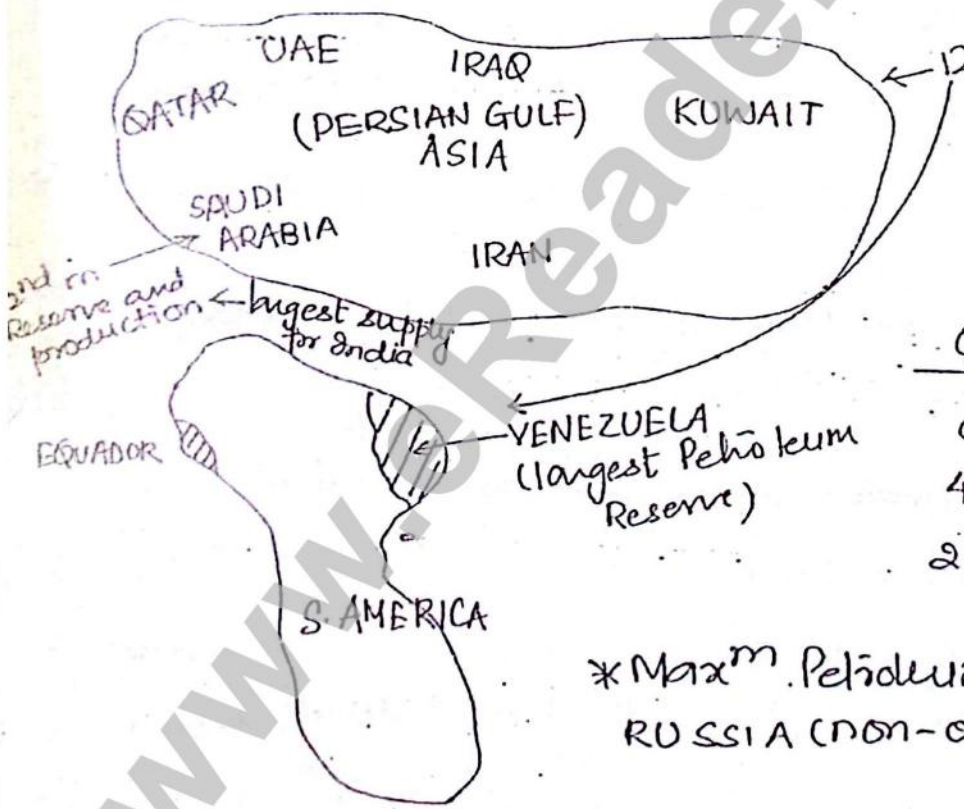


* It is now taken by VEDANTA (ANIL AGARWAL, BRITISH COMPANY).
⇓
ONGC operated on behalf of Indian Govt
⇓
* MANGLA-I } Famous oil
* MANGLA-II } wells of India.

Note: World wide highest Petroleum:



← 12 OPEC COUNTRIES

AFRICA:
LIBYA, NIGERIA
ALGERIA, ANGOLA

OPEC COUNTRIES:
6 (Persian Gulf)
4. (Africa)
2 (South America).

* Max^m Petroleum Production is from RUSSIA (non-opec country).

* $120 – 1 BARREL (159 litre) → crude oil
* Average price decided by OPEC Group.

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Recent discovery of oil is in ARCTIC OCEAN.
Due to melting of ice, due to global warming, petroleum found.

RUSSIA — SIBERIA (largest)
USA — ALASKA (2nd)
DENMARK + NORWAY (very less share).

MNC Related to Petroleum :- (In India).

1) ONGC Videsh Limited (OVL).
2) Reliance Petroleum.
3) OIL India.

In World wide :-

1) GAZPROM — RUSSIA
2) EXXON MOBILE - USA
3) SHELL — NETHERLAND
4) BRITISH PETROLEUM — U.K

NATURAL GAS :-

"BOMBAY HIGH" in India producing maxm "Natural Gas"
2nd is KRISHNA-GODAVARI (K-G Basin)
Andhra - Eastern Coast
D5, D6 - (Dhirubhai Mukesh Ambani Reliance Petroleum)
↳ ONGC involved as govt sector.

Worldwide :-

Russia is no.1 in ~~reserve~~ reserve and production (SIBERIA).
IRAN - 2nd Reserve.
USA - 2nd production.
IPI (Iran Pakistan India) pipeline, project coming from Iran. Also known as "Peace Pipeline."
TAPI (Turkmenistan Afghanistan Pak India) → Project coming from TURKMENISTAN

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METALLIC RESOURCES:

- Ferrous (Fe, Cr, Ni, Co, Tungsten)
- Non Ferrous (Bauxite, Copper, Au, Ag, Pt, Pb, In).

*Ferrous:

→ Rich in India.
→ Max^m metallic mineral is in ODISHA in India.
: Metallic Resources belong to very old period "DHARWAD" period
⇓
on name of a place in odisha "Chotta-Nagpur Plateau"

* Fe – Iron (Iron ore Reserve)

1) MAYURBHANJ } Max^m Iron in India (ODISHA).
2) KEONJHAR }

* SINGBHUM

→ west singbhum. } Jharkhand
→ East singbhum. }

* DANTEWADA – BAILADILA } CG
DURG ⇓
export to Japan.

: Dantewada – Bailadila → Vishakhapatnam Coast → Japan
⇓
ore also used in plant
VIZAG STEEL

* BHILAI STEEL PLANT — Chattisgarh.

* KUDREMUKH, KEMMANGUNDE } Karnataka Mines.

Nagnetite is lesser in Quantity.

Nagnetite – 72-% Fe
Haematite – 60-70% Fe (Max in Ind
Limonite – 50-% Fe
Siderite – < 50-% Fe.

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Worldwide Reserve (Fe) → AUSTRALIA

Production → CHINA
AUS
BRAZIL
INDIA

MANGANESE:

No. 1 state in Mn ~~production~~ → ODISHA (Mayurbhanj, Keonjhar).

*worldwide → 1. china (production + Reserve)
India - 3rd in

CHROMIUM:

No.1 state in India - ODISHA (cuttack).
SUKINDA (90% of Indian Production).

* India is 3rd in world
1) South Africa
2) Kazakistan.
3). India.

Note:

1. Sukinda is at TOP 10 cities in world in pollution
2. VAPI - GUJARAT (Chemical Industry)
3. RANIPET - TamilNadu (leather industry).

NICKEL:

Russia — no.1

TUNGSTEN:

china — no.1

COBALT:

DRC — Dominique Republic of CONGO (Africa)

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NON FERROUS:.

1. BAUXITE :.

*Rich in India

* Largest Producer in India is KBK (Koraput) Region
(Kalahandi, Bolangir)

*VEDANTA is famous in Aluminium, tried to exist, but local people revolted.

*two sites → JHARSUGUDA.
→ LANJIGARH.

*World wide – African country – GUINEA – Reserve.
AUSTRALIA – production.

2. GOLD:.

* Karnataka – KOLAR MINE (deepest
(about to be closed due to high mining cost)

*Karnataka – HUTTI MINE.

*Andhra – RAMGIRI

*World wide:.

Production – CHINA
Reserve – AUSTRALIA

Johnasberg – (largest gold producing city in the world).

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SILVER (Ag):

: Found in small quantity in India in RAJASTHAN AREA
⇓
UDAIPUR
(ZAWAR MINE).

* Ag worldwide
Reserve — PERU
Production - MEXICO.

: Pb, Zn are also found together and they are together called as TWINS.
Those are found near areas where Ag is found.

Ag, Zn, Pb ⟶ UDAIPUR (ZAWAR MINE)

For Pb, Zn :
Worldwide Reserve : AUSTRALIA
Worldwide Production - CHINA

PLATINUM (Pt):

Found only in small quantity in PALAMAU (JHARKHAND)
Also called as WHITE GOLD (more precious than Gold)
Worldwide : SOUTH AFRICA

DIAMOND :

* M.P - PANNA (only found in this area in Asia).

* Worldwide : (KIMBERLAY - city in SA famous for Diamonds).
Reserve : DRC (Democratic Republic of CONGO).
Production :

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*KOHINOOR— was found in GUNTOOR (area of Andhra) but now in British Reign.

*MICA :-

*Basically called as sheet Mica in India, for which India is no.1.

* 1st ⟶ NELLORE (Andhra)
2nd ⟶ KODERMA (Jh)

* For overall Reserve in MICA :-
1st in Reserve — BRAZIL
2nd in Reserve — JHARKHAND.

*ATOMIC FUELS :-

*Thorium is found in India
⇓
extracted from Sand called as MONAZITE SAND. (found max^m in India).

*found in KERALA (MALABAR COAST).

*URANIUM — Found at JADUGUDA MINE (Jh).
- Reserve — AUSTRALIA (1st).
- Production — KAZAKASTAN (1st).

*COPPER :-

*Available in less quantity.
- MP (BALAGHAT) → MALANJKHAND (produces 2/3rd of Cu of India).
- RAJASTHAN (KHETRI) ← oldest mine in India in all category of oldest

*Woold wide :-
1. CHILE

* KHETRI MINE belongs to the HARAPPAN ERA.

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AGRICULTURE IN INDIA:

* About more than 50% population is engaged in Agriculture
About more than 50% Indian Land is Fertile.

⇓

GDP (Gross Domestic Product)

⇓

low in India.

(13% of total GDP contributed by Agriculture, rather 50% pop^n & land is engaged)

Agriculture Seasons:

1 → most imp.

(2) RABI (WINTER)
- Wheat ①
- Mustard
- Potato
- Barley
- Gram
- Peas
- etc

i) KHARIF (RAINY)
- 1) Rice (Paddy) ① (① - overall in India)
- 2) Bajra
- 3) Jwar
- 4) Ragi
- 5) Maize
- 6) Soyabeen
- 7) Groundnut

(Millets (mota Anaj))

(3) ZAID (March - May) (SUMMER).
- 1) cucumber
- 2) water melons
- 3) melons.

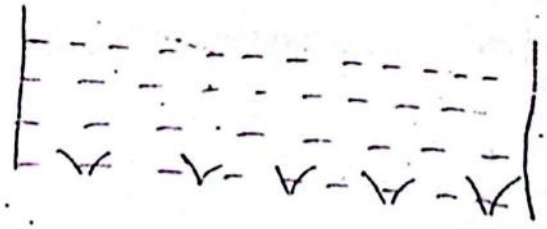
RABI:

As winter has less Rain.

Hence irrigation required (PUNJAB, HARYANA, WESTERN PART OF UP.).

RICE:

* Max^m Area under India.
* Rice in field is called as PADDY, after removal of chaff it is called as RICE.



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* NO.1 state in production of Rice:.
  1) W. B.
  2) PUNJAB.
  3) U.P.
  4) ANDHRA

* Rice Production in India is about 90-100 million TONNE.
  1. CHINA
  2. INDIA

*WHEAT:.

* Irrigated crop.
* less temp & less Rainfall.

WHEAT
↳ 1. UP
2. PUNJAB
3. HARYANA
4. RAJASTHAN

Total wheat Production — 80-90 million Tonne
1. CHINA.
2. INDIA.

MAIZE (CORN):.

* Grown in b/w wheat & Rice.
* Requires less temp & water than Rice, but more than wheat

1. KARNATAKA. | Production → 15-20 mt
2. ANDHRA.

*worldwide:.

1. USA → PIGGERY
→ ETHANOL Manufacturing. (USA is no.1)
(Petrol mix)
Biopetroleum.

* BIODIESEL — JATROPHA — grown even in BARREN LAND. (In India)

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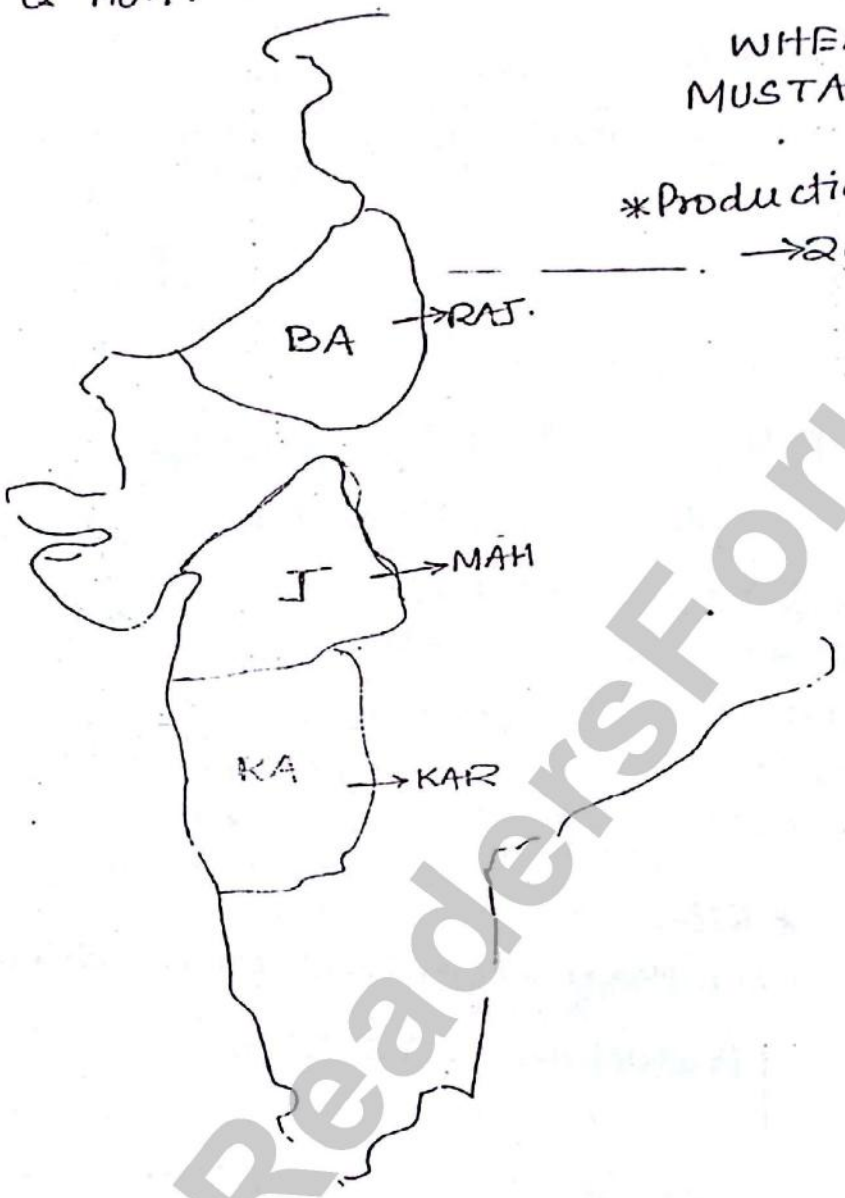
* MILLETS :. (Jwar, Bajra, Ragi).

* ~~Maize Coarse Grain Crops~~.

India is no.1.

WHEAT — Golden colour
MUSTARD - yellow colour.

*Production of Millets
→20-25 million Tonnes



PULSES (Leguminous Crops) :.

↓

leguminous crop (Rhizobium Bacteria is found in Roots of Pulses and Convert the At. Nitrogen to Nitrates in the soil).

↓

Nitrogen fixation

These are used for CROP Rotation.

India is no.1 in production of Pulses. → MP. no.1 in Pulses.

Production in 2011 - 18 mt
Production for below - 14 mt

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NOTE:

The above crops:

1) Rice
2) wheat
3) Maize
4) Millets
5) Pulses

} FOOD GRAIN CROPS

≈ 250 million tonnes.

Rank of India on the above data

1. CHINA.
2. USA.
3. INDIA.

*States of India in Production:

1. UP.
2. PUNJAB.

OIL SEEDS:

*Commercial Crop

MUSTARD	SOYABEAN	GROUNDNUT	SUNFLOWER
1. PUNJAB	1. M.P	1. GUJARAT	1. KARNATAKA.

→ M.P is no.1 for overall seeds production
→ cheapest protein source is soyabean.

*SUGARCANE: ← Irrigation crop (about 97% of total production is irrigated).

→ UP is no.1 (Western Part) (GHAZIABAD, Sharanpur, Meerut).
→ Maharashtra is no.2 (SATARA, SOLAPUR).

*Worldwide:

1. BRAZIL
2. INDIA

TOBACCO:

1st
1. (ANDHRA, GUJ, KAR. (mainly in CIGRETTE manufacturing)
2. UP, BIHAR, W.B (KHAINI, PAN MASALA etc)
3. M.P (BIDI – TENDU leaves)

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Knowldwide:
1. CHINA (culture of chain smoking, no export rather consume all).
2. BRAZIL OR INDIA.

TEA, COFFEE AND RUBBER:

- Together called as Plantation crop.
- These are long duration crop.
- These are grown in high temp. (TROPICAL COUNTRIES).
- These have been introduced by COLONIAL COUNTRIES in their colonies in Tropical Region.

→ TEA (ASSAM, WB-Darjeeling, TAMIL NADU) (High rainfall area, & hilly areas). } Requires no stagnation, flow of water required)
→ COFFEE
→ RUBBER.

TEA —— 1. CHINA (GREEN TEA)
2. INDIA. (BLACK TEA).

* Import of Tea is more than EXPORT (to UK, FRANCE)
⇓
(Srilanka, Kenya)

COFFEE:

1. KARNATAKA is no.1 in coffee plantation, Kerala is no.2.

coffee
↓ ROBUSTA (In India, Robusta is grown)
↓ ARABICA (Better quality)

BRAZIL is no.1 in production → SANTOS (city in Brazil) – called as "COFFEE PORT"
VIETNAM is no.2 in production.

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RUBBER :- → In India, Kerala is no.1
Tripura.
worldwide : 1) THAILAND
2) INDONESIA

*COTTON :-
1. GUJARAT.
2. MAHARASHTRA.
due to blacksoil.
| HARYANA, PUNJAB
Irrigated

worldwide :-
1. CHINA
2. INDIA

*JUTE :-
1. INDIA → WB (Hooghly River valley).
2. B'DESH.

HORTICULTURE CROPS :-
→ fruits.
→ vegetables.

*worldwide :-
1. CHINA
2. INDIA

*Mango 1. INDIA → Maharashtra (HAPOOS, ALFANSO)
U.P (DUSSERI), MALDA in UP is called as LANGDA
WB, BIHAR. (MALDA) (due to change climatic condn).

*Banana :-
1. INDIA → Tamil Nadu

ONION & POTATO :-
↓
1) Mah (Nasik)
2) Guj
→ 1. UP (FARRUKHABAD).
2. WB.

CHILLY :-
↓
Andhra Pradesh

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GREEN REVOLUTION IN INDIA:

1. We imported wheat from other country (WHEAT).
2. In 1966 → severe drought condn hit India.
3. 2 scientists introduced Green Revolution
   - → M.S SWAMINATHAN
   - → NORMAN BORLOUGH
4. Suggested to use mexican seeds (HYV seeds) (WHEAT) and also use of chemical fertilizers.

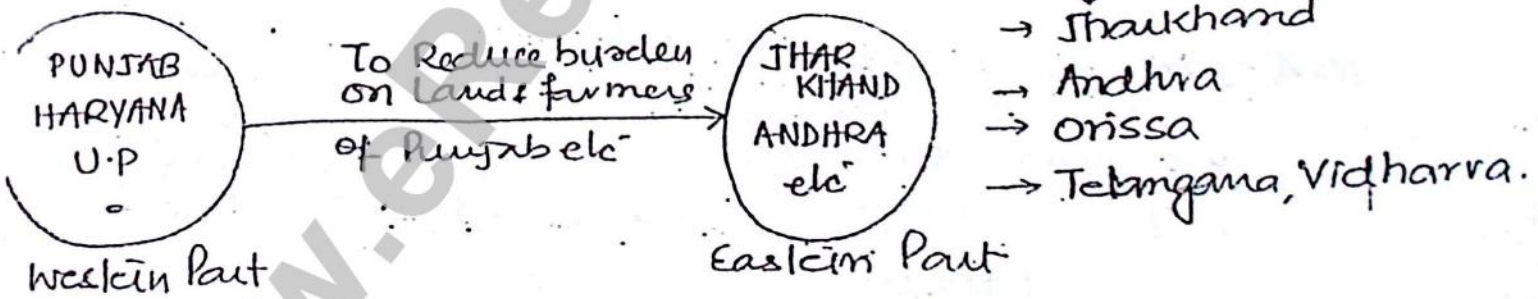
Irrigation provided to:-

1) Haryana
2) Punjab
3) western UP.

within decade, after introduction of HYV, we produced surplus and also exported

This ERA is called as "GREEN REVOLUTION ERA" (1966-67 to 1976-77).

To decrease the burden on land of Punjab, a 2nd Green Revolution also started in the Eastern States (started in 2005).



WHITE REVOLUTION IN INDIA:-

Related to MILK production — AMUL → VARGHESE KURIEN (given the task of Op" Flood.)

1970 → OPERATION FLOOD (AMUL MODEL) {Anand Milk union Ltd}

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*AMUL MODEL

↓

use of co-operative

↓

supply to the AMUL by the farmers and profit given to them.

*within this decade, India became no.1 in world, to AMUL-MODEL. → To open different AMUL type system in diff states.

- MOTHER DAIRY — Delhi
- PARAG — UP
- SARAS — RAJ
- VITA — HAR.
- VERKA — PUN
- AANCHAL — UK
- SANCHI — MP
- NANDINI — KAR
- SUDHA — BIHAR.

*Blue Revolution:-

Fishes

↓ Fresh water
(1. WB

↓ saline
1. GUJ & KERALA.

*W.B is no.1 in production of fishes.

*In production of fresh water, worldwide
1. CHINA
2. INDIA

In saline fishes 1. CHINA

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NATIONAL HIGHWAYS & TRANSPORTATION:

* TRANSPORTION
  - → ROADWAYS (≈ 33 LAKH KMS) → 1. USA 2. INDIA
  - → RAILWAYS.
  - → SEAWAYS.
  - → AIRWAYS.
  - → Pipelines (Energy pipelines).

ROADWAYS:

- KUTCHA (40% of total). (Unsurfaced Road)
- PAKKA (60% of total) (Surfaced Road).

More PUKKA Road, due to Pradhan Mantri Gram Sadak Yojna

Quality of Road, a project called NHDP is being run in India to improve quality of Road.

NHDP is controlled by NHAI — started in 1997.

Highways length — 75000 km (2% of total Roadways).
⇓
(carries 40% of total Traffic)

These highways are congusted (Choked) which can be reduced by increasing the width of these highways.

The quality control of Road by NHDP is divided in 7 phases.

Phase 1: GOLDEN QUADRILATERAL PROJECT → 4/6/8 (5846 km).
(MUMBAI, DELHI, KOLKATA, CHENNAI).

Phase 2: N-S CORRIDOR & E-W CORRIDOR PROJECT
- (SRINAGAR TO KANNAKUMARI 4/6
- PORBANDAR TO SILCHAR.

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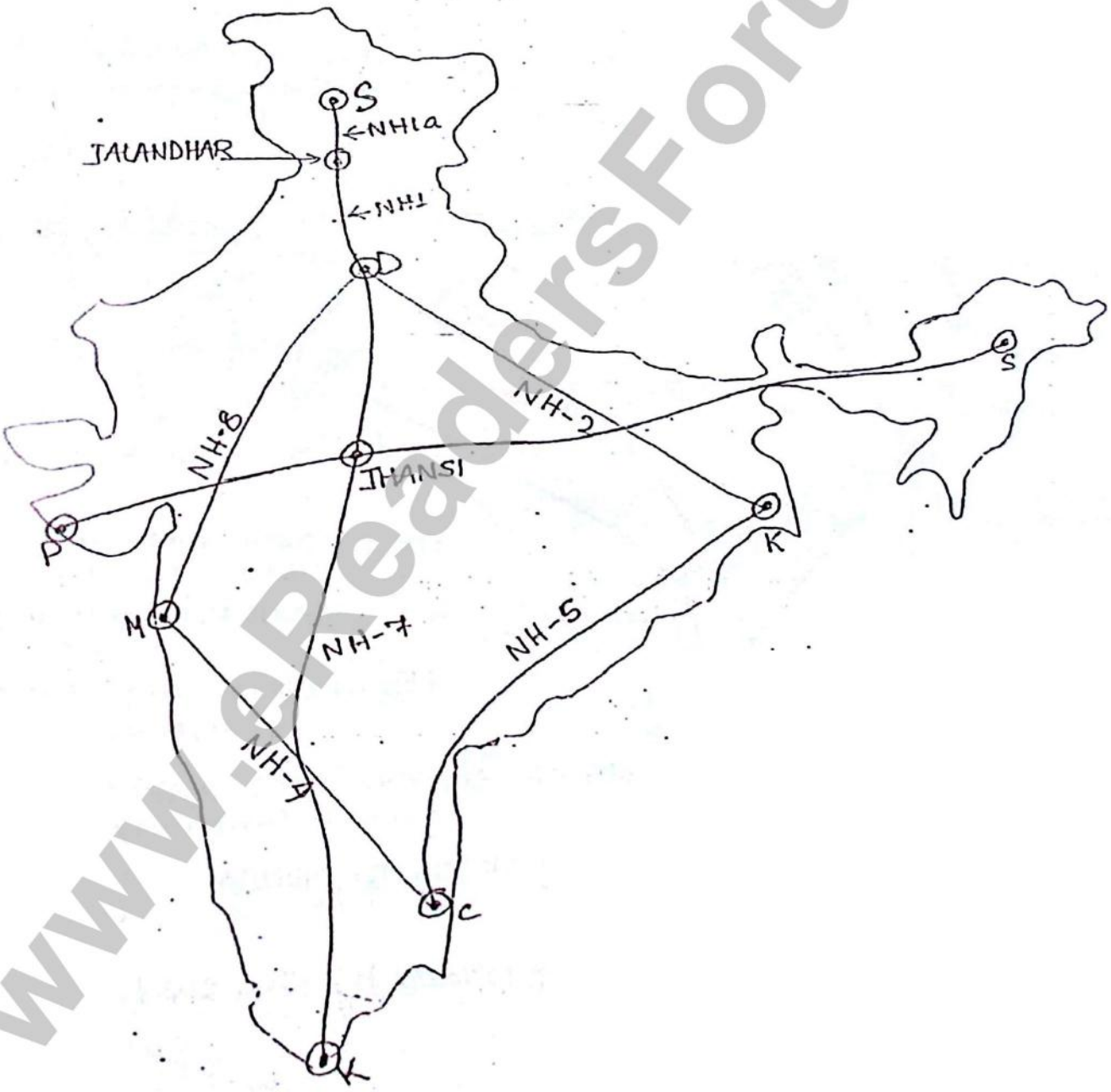
Phase 3
Phase 4
Phase 5
} Already started.

Phase 6
Phase 7
} yet not started.



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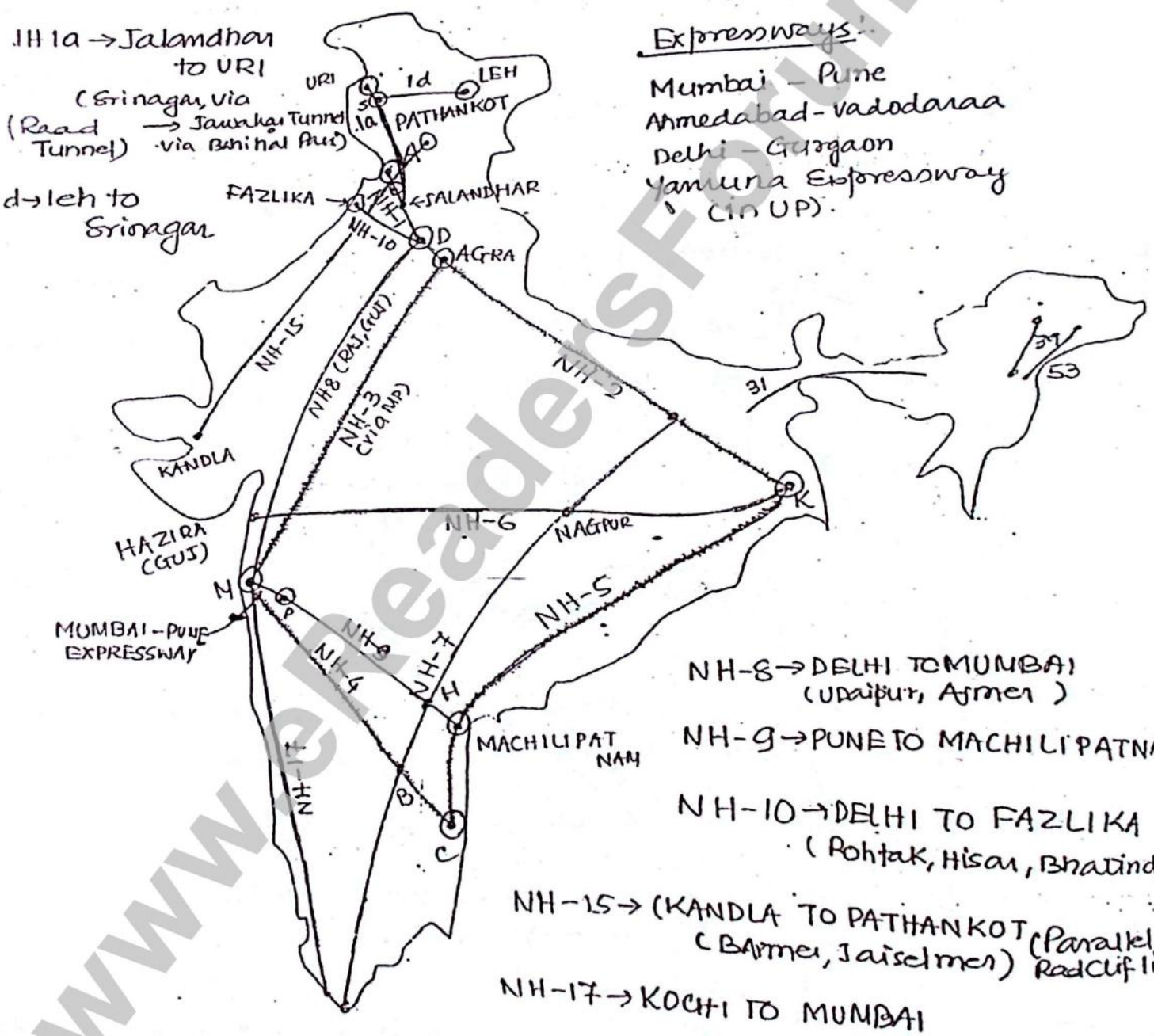
NH-1 → Delhi to Amritsar (Ambhala, Ludhiana, Jhalandhar).
NH-2 → Delhi to KOLKATA (Varanasi, Allahabad, Kanpur).
NH-3 → AGRA TO MUMBAI (via Gwalior, Indore).
NH-4 → MUMBAI TO CHENNAI
NH-5 → CHENNAI TO KOLKATA.
NH-6 → KOLKATA TO HAZIRA (2nd longest highway).
NH-7 → VARANASI TO KANNAKUMARI (NAGPUR, hyderabad, Bengaluru)
→ (longest highway).



Famous Road → GRAND TRUNK ROAD (made by Sher Shah Suri).

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NH-31 → Gateway to North-East
NH-39 → Lifeline of Manipur.
NH-53 → Parallel to NH-39.

NH-47-A (Shortest National Highway → only 6 Km) ← in KOCHI (KERALA) TO WELLINGDON ISLAND. } largest Shipyards of India.

*Meeting Points :-
2 & 7 → Varanasi
6 & 7 → Nagpur.
7 & 9 → Hyderabad.
7 & 4 → Bengaluru.

Note :-
GOLDEN TRIANGLE —(OPIUM)→ Thailand – Myanmar – India
↓ Transportation.
Delhi – Agra – Jaipur

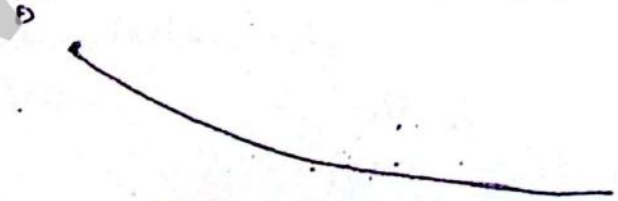
*RAILWAYS :- ← Total Railway Route
→ USA.
→ RUSSIA.
→ CHINA.
→ INDIA (> 64000 Km)

Railway Route
B
(x)
A

Railway Track.
2x

* Annual Passenger Travelling
India is no.1.

* Delhi – Howrah ← BUSIEST Railway Route



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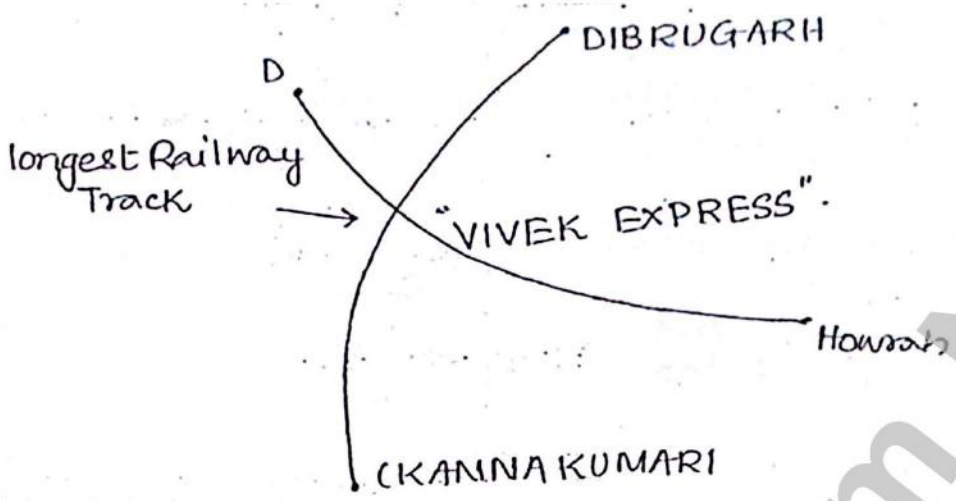

: Highest Railway Track → DARJEELING - SILIGURI
(Till date).
(NARROW GAUGE - 0.61 m)

: JAMMU - BARAMULA → under Constr ← will be the highest.

UDHAMPUR
KATRA
KAZIGOM ANANTNAG
SRINAGAR

J → Jammu
U → udhampur } under Constrn (longest railway Tunnel Near Balihal Pass)
K - Kalra
K - Kazigund ←
A - Anantnag } running
S - Srinagar
B - Baramula

ighest Railway ridge of world ver Chenab)

Presently GOLMUD - LHASA (highest Railway Route)
(CHINA)

2st Trains:

JAPAN (2003) → MAGLEV (580 Km/hr). ← TESTING
(Non Conventional) ← without wheel

FRANCE (2007) → TGV (575 Km/hr) ← Testing
(model V150)

CHINA (2011) → CRH (487 Km/hr) ← Running
(380-BL)

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INDIA → SHATABDI (150 Km/h)
(Delhi to Bhopal)

*HSRA (High speed Railway Authority) will be established to look over high speed service

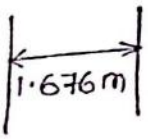
*BULLET (SHINKANSEN - in Japan) TRAIN will be running over these areas in India (6 Regions) (250 Km/h)

1) Delhi – Amritsar }
2) Delhi – Patna. } ——.

*Electrification of Railway Route:

*Around 32 % of Railway Route electrified.
*Around 46 % of Railway Track electrified.

* BROAD GAUGE → 90 % of Railway Track.



* Another Gauge, in Metro Railways is used STANDARD GAUGE (1.435 m)

* 0.61 m (Narrow Gauge) → Darjeeling - Siliguri } Recognised by UNESCO.
* 0.76 m (Narrow Gauge) → KALKA - Shimla } Recognised by UNESCO.
→ OOTY ← in nilgiri hills
NILGIRI RAILWAY.

*Metro under Constr^n:

1. Mumbai.
2. Jaipur.
3. Chennai.
4. Hyderabad.
5. Patna.

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* KOLKATA Mchō is latest entry into the Railway Zones.
* Total 17 zones are existing in India
* NORTHERN RAILWAY is THE largest zone (HQ – DELHI).

WATERWAYS:

- INLAND WATERWAYS
- SEA WATERWAYS

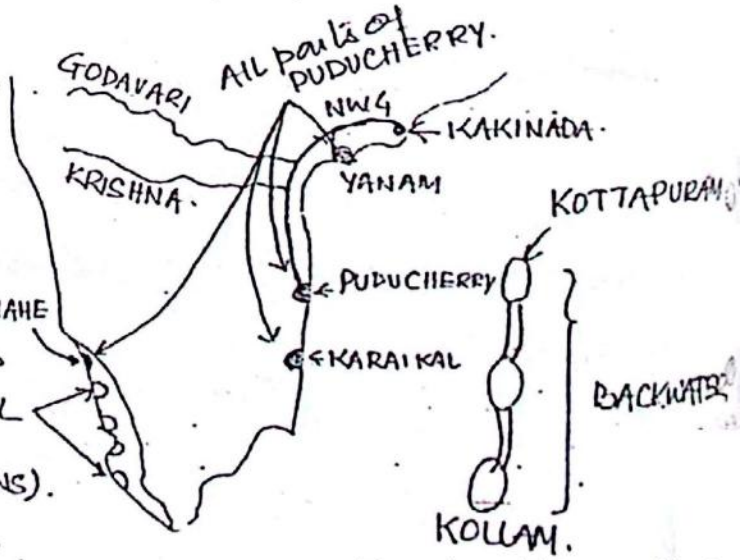
Basically on
1) Ganges
2) Brahmaputra
3) Hooghly

INLAND:

Basically there are 4 waterways existing in India.

longest → NW1 → on Ganga & Hooghly (Allahabad to Haldia).
NW2 → on Brahmaputra (Sadia in Assam — Dhubri in Assam).
NW3 → Kottapuram to Kollam.
NW4 → Puducherry to KAKINADA (via canal — BUCKINGHAM CANAL).

Proposed { NW5, NW6



For Tourist purposes, these lagoons are connected via Canals, and these series of LAGOONS are called BACKWATERS

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*Lagoon in Kerala, famous LAGOON is VEMBNAD

*largest lagoon of India is CHILKA LAKE (largest lake of India) (Saline water)

Note:

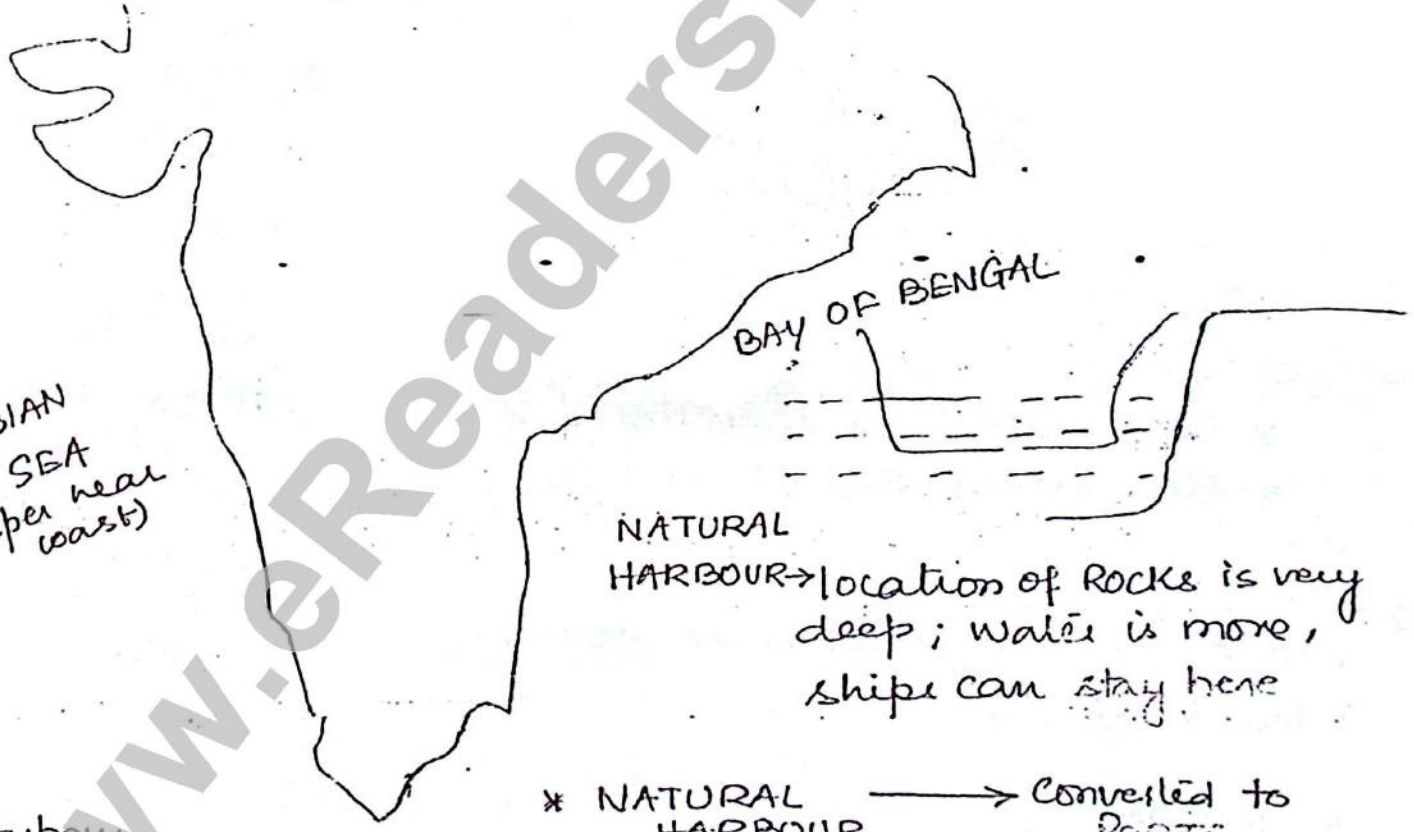
NW5 → It is proposed and will be linking MAHANADI & BRAHMANI.

NW6 → Mainly on BARAK river in NorthEast

*WORLDWIDE:

* EUROPE has the Best network of Waterways (Inland)
* Basically the most Imp. River for navigation in EUROPE is RHINE RIVER (Busiest River)

*SEAWAYS: VIA PORTS/NATURAL HARBOUR


BAY OF BENGAL
ARABIAN SEA (deeper near coast)
NATURAL HARBOUR → location of Rocks is very deep; water is more, ships can stay here

Ports/Harbour
↓
Minor/Major

1. MAHARASHTRA

* NATURAL HARBOUR → Converted to PORTS
  (older) (Newer)

* 13 major ports, 6 each on Eastern & western Coast and the latest is on PORT BLAIR

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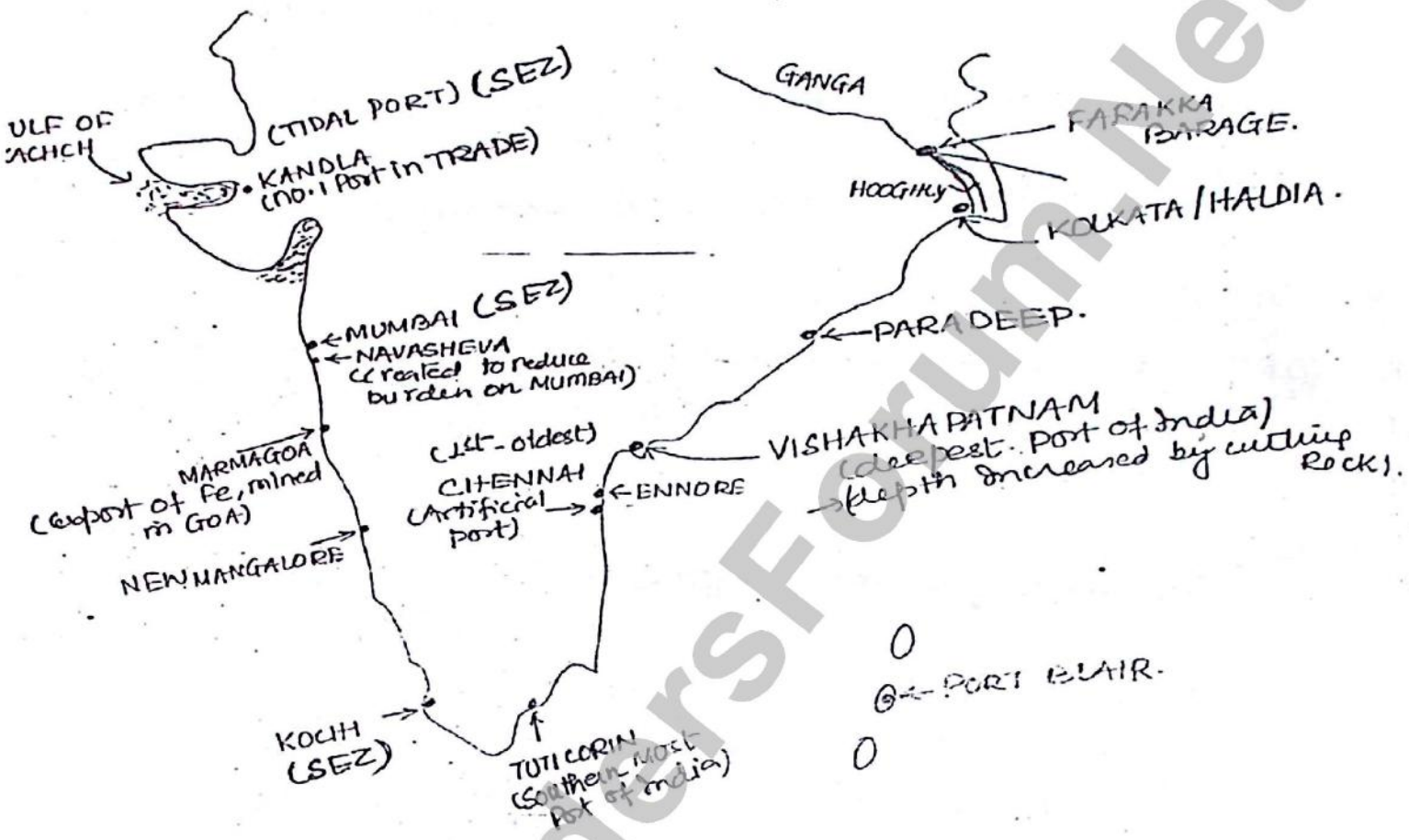
Gulf of Kachch, experience, high tides and hence large wave accumulate so large ships can be navigated.



IAWASHEVA :-

* Also called as JAWAHAR LAL NEHRU PORT
* Also called as HITECH PORT.

* SEZ :-

* laws are different and flexible
* low taxes etc

: KOLKATA - HALDIA :-

* located on Hooghly River
* low depth and sediments are drilled out to increase depth. (DREDGING)
* FARAKKA - BARAGE - Created to regulate the water of Ganga. and increase the water content of HOOGHLY

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ENNORE:
* developed as 1st Private Port
* developed to replace Chennai Port, as the depth is not high of Chennai Port

*WORLDWIDE:
* SHANGHAI — NO. 1 port, due to major trade of CHINA with other countries.

*PIPELINES: ← Energy Pipeline

Jagdishpur (UP)
↙
Hazira (GUJ) → HBJ ⟶ longest pipeline of India (Natural Gas).
↑
Bijaipur (MP)

HBJ ⟶ Extended upto SAWAI MADHOPUR (RAJ)
→ Managed by GAIL
* mainly used for
1) Thermal Power plant
2) Chemical Plants
3) Atomic plants

*LPG: (longest)
JAMNAGAR (GUJ) —— LONI (UP) ← Managed by PUNJ-LLOYD.

*CRUDEOIL:
longest:
SALAYA (GUJ) —— MATHURA (UP) —— PANIPAT HAR.

*OIL PIPELINE:
MUNDRA (GUJ) —— DELHI

*MULTI PRODUCT PIPELINE:
KANDLA (GUJ) —— BHATINDA (PUN).

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OIL REFINERIES:-

* A large no. of refineries is established by IOCL.
* JAMNAGAR REFINERY — largest Refinery of ASIA

1. JAMNAGAR ← Reliance Petroleum
2. PANIPAT } IOCL (PSU).
3. KOYLI }

* BHATINDA REFINERY ← HPCL + MITTAL ENERGY (Joint Venture)
  under constrn
  ↓
* BINA REFINERY ← BPCL + GULFOMAN (Joint Venture)
  (MP)
* ESSAR REFINERY ← Totally Private Sector (owned by ESSAR GROUP)
  near "VADINAL"

POPULATION :- (Census 2011)

* Census 2001 → 1.02 billion
  Census 2011 → 1.21 billion
  } Increased by 19 crores.

10 lakh families → 10% → 11 lakh
Increase 1 Lakh

20 lakh families → 6% → 21.2 lakh
Increase 1.2 lakh.

* Growth Rate:-

2001 → 21.54 %.
2011 → 17.64 %. ← least growth Rate since Independence

* NAGALAND → ① - 0.3 %. ← least growth Rate state. (2011)
  → 64 %. ← Highest growth Rate state.

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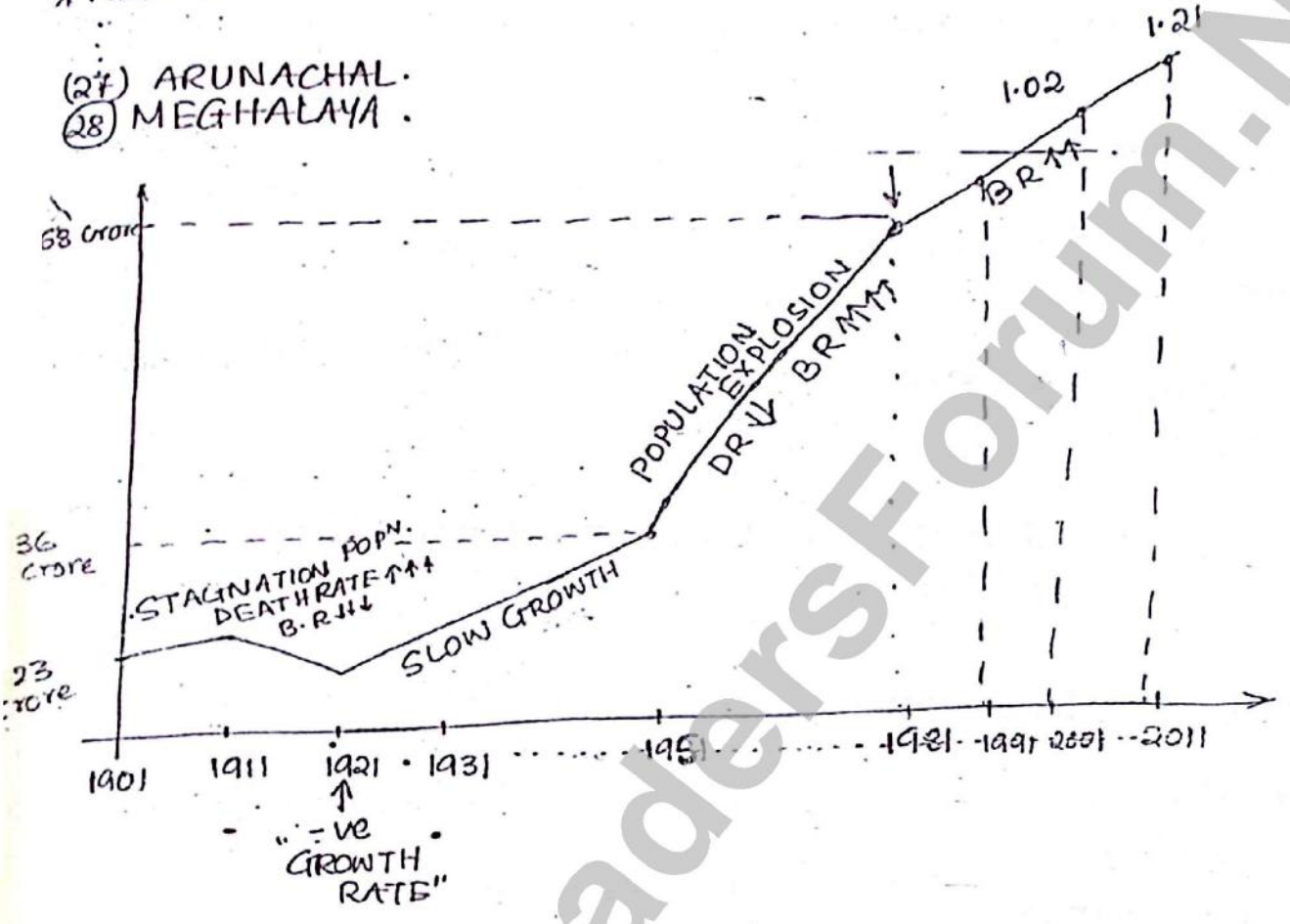
Note:

* Cause of growth of Indian population is LARGE BASE
  ⇓
  Means large no. of families.

(2)

* KERALA ⟶ 4.86 %.

(27) ARUNACHAL.
(28) MEGHALAYA.



* 2045 ← year to achieve stabilisation (Popn ≈ 1.7 billion).

* 1961 – 1971 ← Highest decadel G.R

1911 – 1921 ← lowest G.R, before Independence

2001 – 2011 ← lowest G.R, after Independence.

Popn:
1. UP
2. MAH
3. BR
4. WB
:
28) SIKKIM.

Popn Density:
1. BIHAR ← 1102 Person Per sq. km.
2. W.B
3. KERALA
4. U.P
:
35) ARUNACHAL – 17 Person Per sq. km

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* SEX RATIO :-

* Unfavourable Sex Ratio.

2001	2011
933 Female / 1000 male	940 Female / 1000 male.

* According to 2011, in age group 0-6 yr, only 940 Female / 1000 male.

* Problem of least sex Ratio in :-
1) J & K
2) HARYANA → 877
3) ~~Kerala~~
:
27) TamilNadu ← 995.
28) KERALA ← 1084

* PUDUCHERRY → highest Sex Ratio, more than 1000 among U.T.

: WORLDWIDE :-

CAUCASUS countries have high Sex Ratio :-

1. ARMENIA
2. GEORGIA
3. AZERBAIJAN.

*least Ratio :-

1. KUWAIT.
2. QATAR.

: literacy Rate :-

1. KERALA → 93 %.
:
28) BIHAR → 63 % (2011)
47 % (2001)

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* Average National Literacy Rate of India → 74%.
Male literacy → 82.14%.
Female literacy → 65.46%.

*URBANISATION :.

According to 2011, 31.12% of Indian population is URBAN Population.

*Worldwide, 50% of world population is URBAN.
→ 2009/2010 → Era of dominance of URBAN/CITY

* State of Max^m urbanisation :.

1. GOA (62%.)
2. MIZORAM (51%.)

} In terms of % of their pop^n

* In terms of total Population :.

1. MAHARASHTRA

*. %. wise highest in Rural Population :.

1. HIMACHAL PRADESH. ← State of least Urbanisation or highest Rural pop^n.
(89%.) living in Villages.

*MILLION PLUS /METROS :.

*According 2011, over 10 lakh population in those cities
→ around 583 cities are mchos

1. MUMBAI (1.83 Cr)
2. DELHI (1.63 Cr)
3. KOLKATA (1.42 Cr)

} Megacities as pop^n > 1 Cr).

4. CHENNAI (< 1 Cr)
5. BENGALURU
6. HYDERABAD
7. AHMEDABAD
8. PUNE
9. SURAT.
10. JAIPUR.
11. KANPUR.

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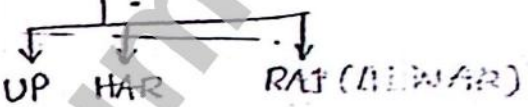
* According to 2001 census, only 35 cities were having popn > 10 lakh (1 Million).

* Recent entries are!.

53) KOTA.
52) JODHPUR.
51) GWALIOR.
50) CHANDIGARH.
49) GHAZIABAD.
48) SRINAGAR.
47) DURG/BHILAI.

GREATER MUMBAI
— 2.07 cr.

NCR — 2.17 cr.



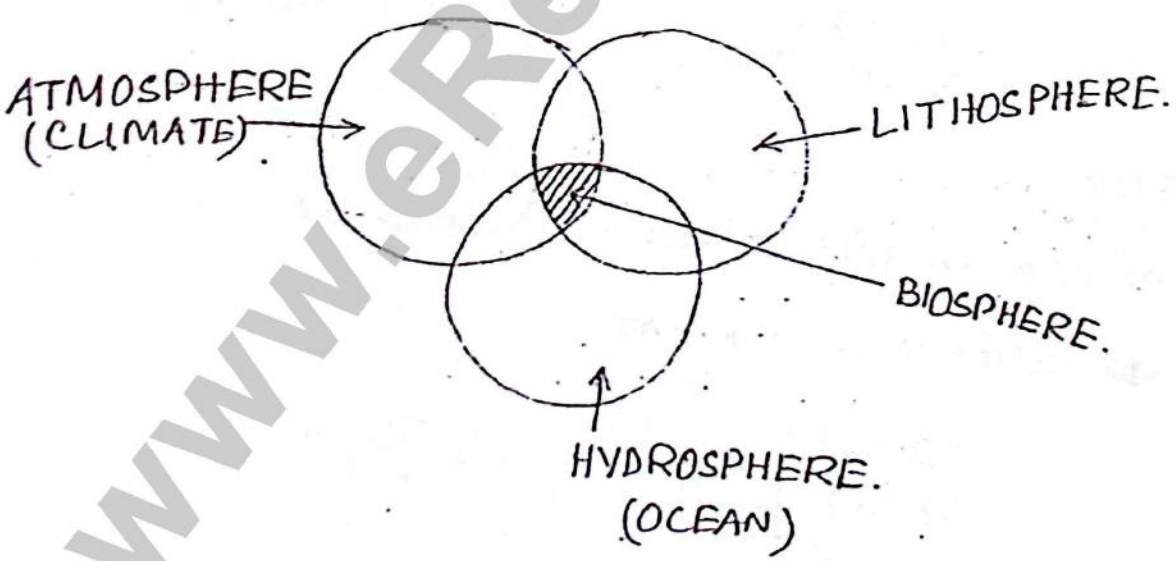
*World wide!.

No. 1 in population cities.

1. TOKYO
2. MEXICO CITY.

PHYSICAL GEOGRAPHY.

~~INDUSTRIES~~



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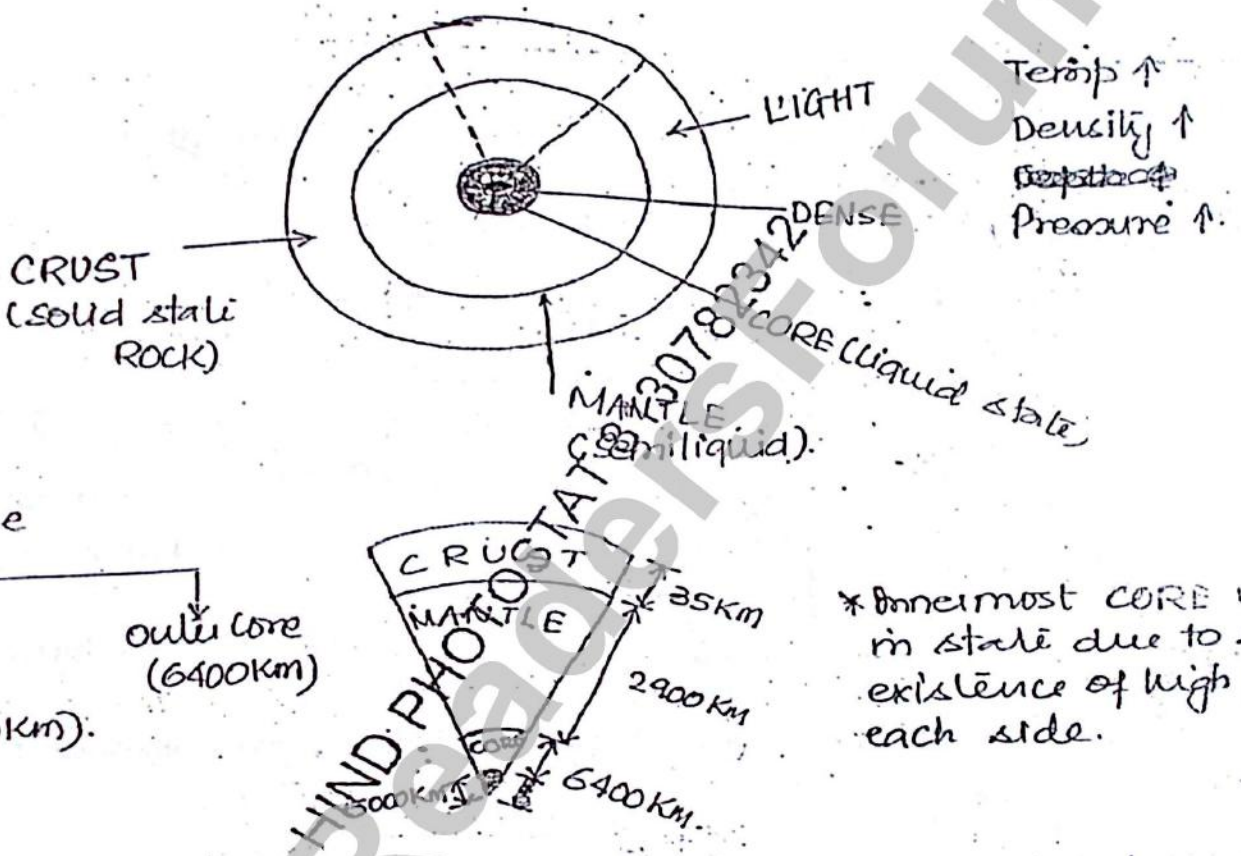
1- LITHOSPHERE:

a). Internal structure of Earth.
b) Plate Techtonics.
c) Earthquakes / Tsunami / Volcanoes / young mountain form:

a) INTERNAL STRUCTURE OF EARTH:



core
- inner core (5000Km).
- outer core (6400Km)

* Innermost CORE is solid in state due to the existence of high from each side.

* Maxm depth of Drilling is 12Km in RUSSIA for Petroleum (in world).

RUSSIA
- KOLA (12Km)
- SAKHALIN. (12Km)

SEISMIC STUDY: To study the action of Volcanoes and Earth quakes, beneath the surface of Earth and it confirms that inner part of Earth is liquid (outer core).

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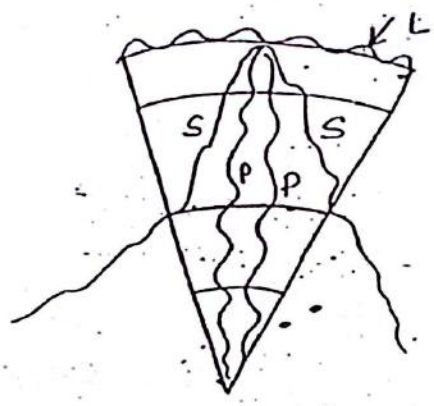
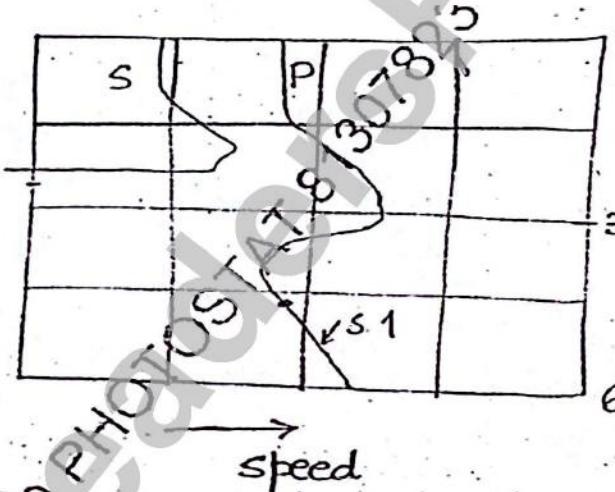
* large energy is released during Earthquakes in three structure

→ P (Primary wave). } runs beneath the Earth.
→ S (~~surface~~) Secondary wave }
→ L (surface) love wave } max^m damage causing.



SEISMOGRAPH:-



HINT

'S' wave cannot pass through liquid state; and ends at 2900Km.

Sudden ↑ of P at certain depth gives idea that the ~~speed~~ state from solid has changed to liquid

CORE mainly consists of NICKEL & FERRIC.

"CORE made up of "NIFE"

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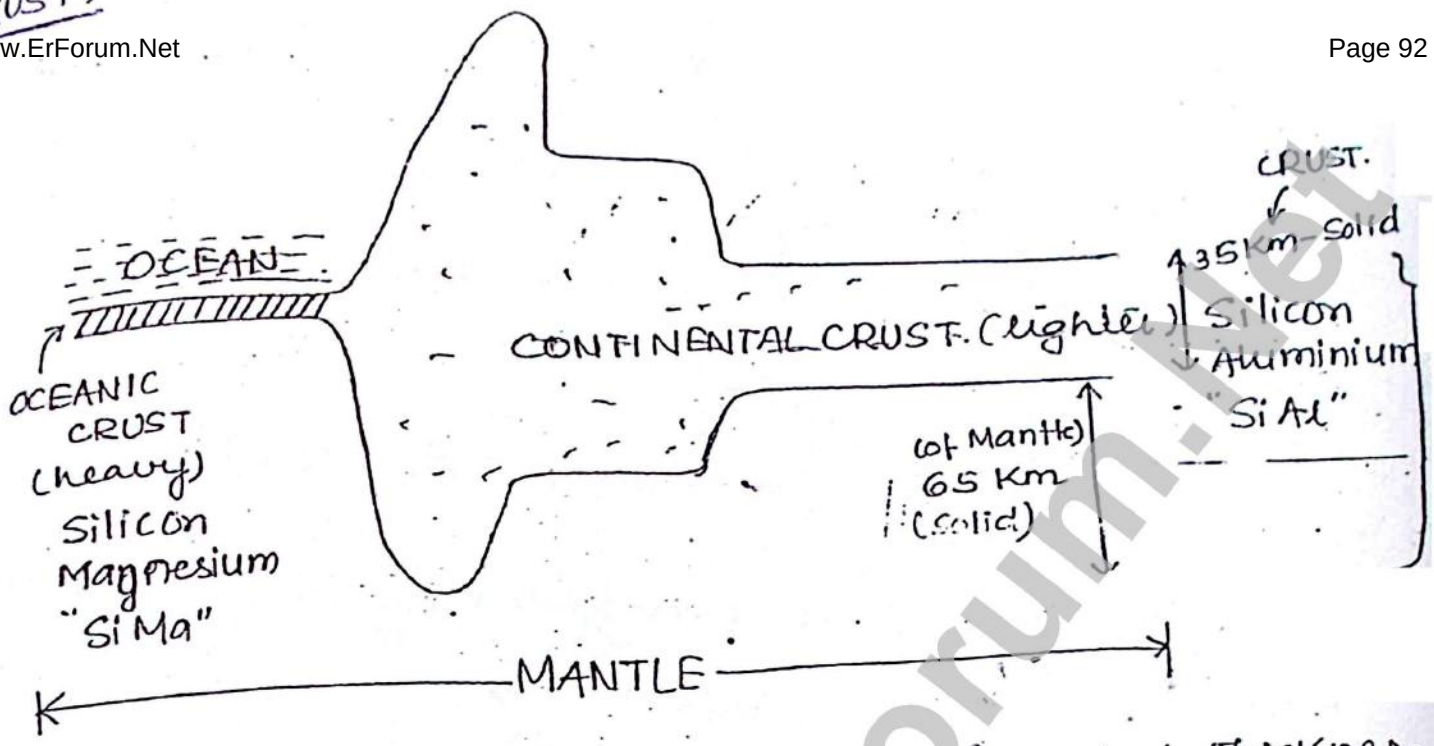
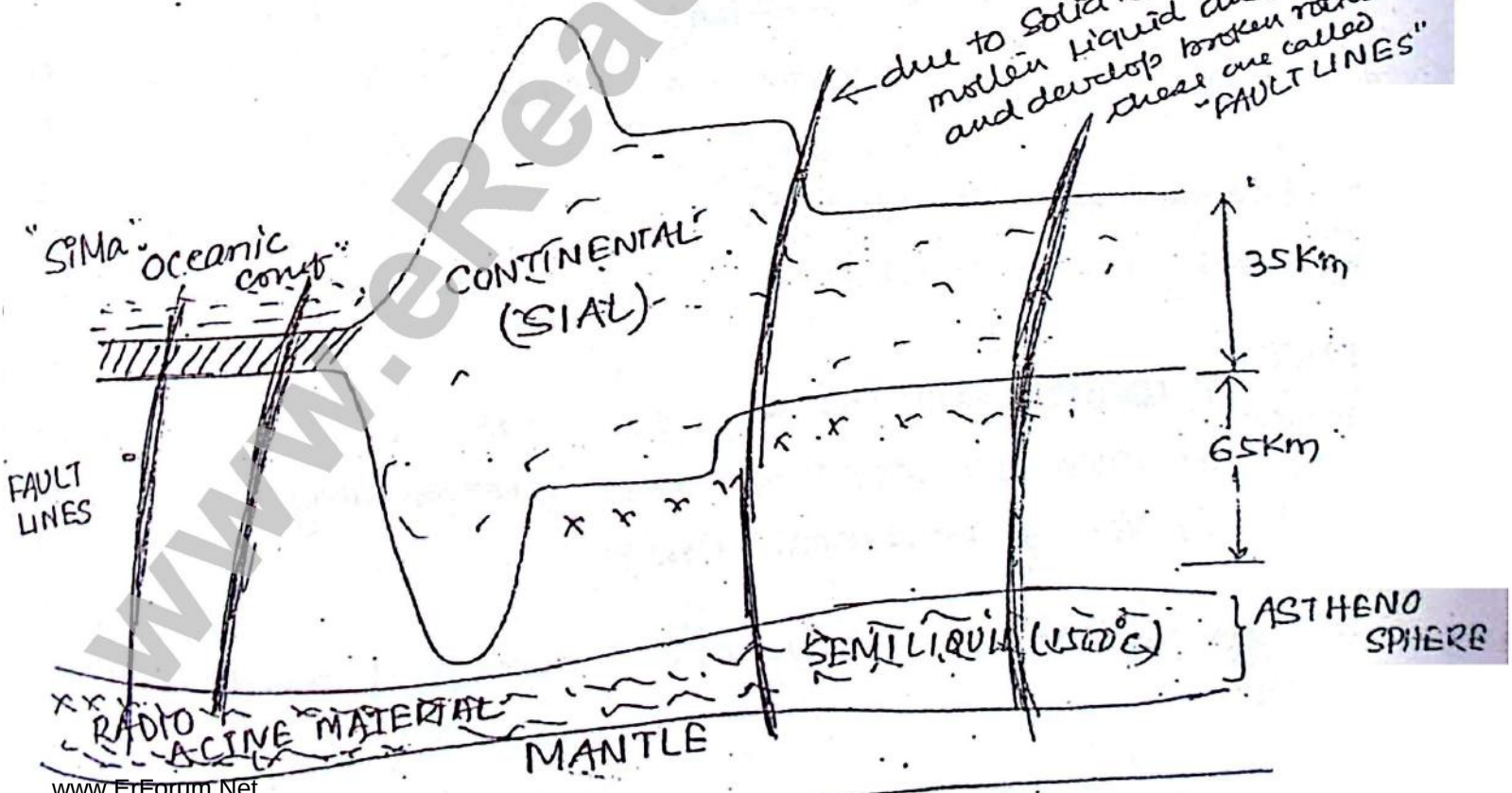


*Oceanic crust is thin and Continental crust is Thickner.
*As Earth Rotates, and mountains are high, so they need to have deep root to retain mechanical stability, otherwise they will collapse.

* continental crust — Silicon
Aluminium.



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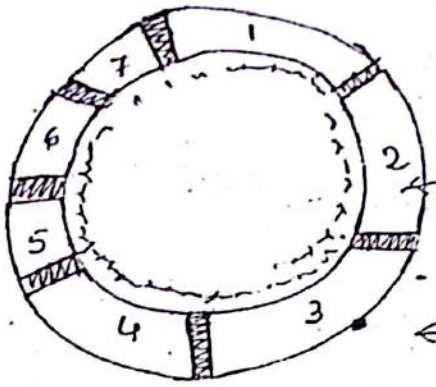
* As these plates, are floating over molten material, hence it result in Earthquakes / Volcanoes through "FAULT LINES"



← Plates (Major plate are 7 in no).

← "PLATE TECTONICS"

* Plates are moving and it is suggested by PLATE TECTONICS

Plates	Name
1.	PACIFIC PLATE (largest).
2.	EURASIAN PLATE
3.	INDO-AUSTRALIAN PLATE
4.	AFRICAN PLATE
5.	NORTH AMERICAN
6.	S. AMERICAN
7.	ANTARCTICA PLATE.

Max^m divergence → Antarctic

Max^m convergence → PACIFIC

CONVERGENCE:

DESTRUCTION

1) Earthquake
2) Volcanoes. (optional Event)
3) Young Fold mountain.

} compulsory

Volcanoes are formed where plates are convergent and ocean is also present.

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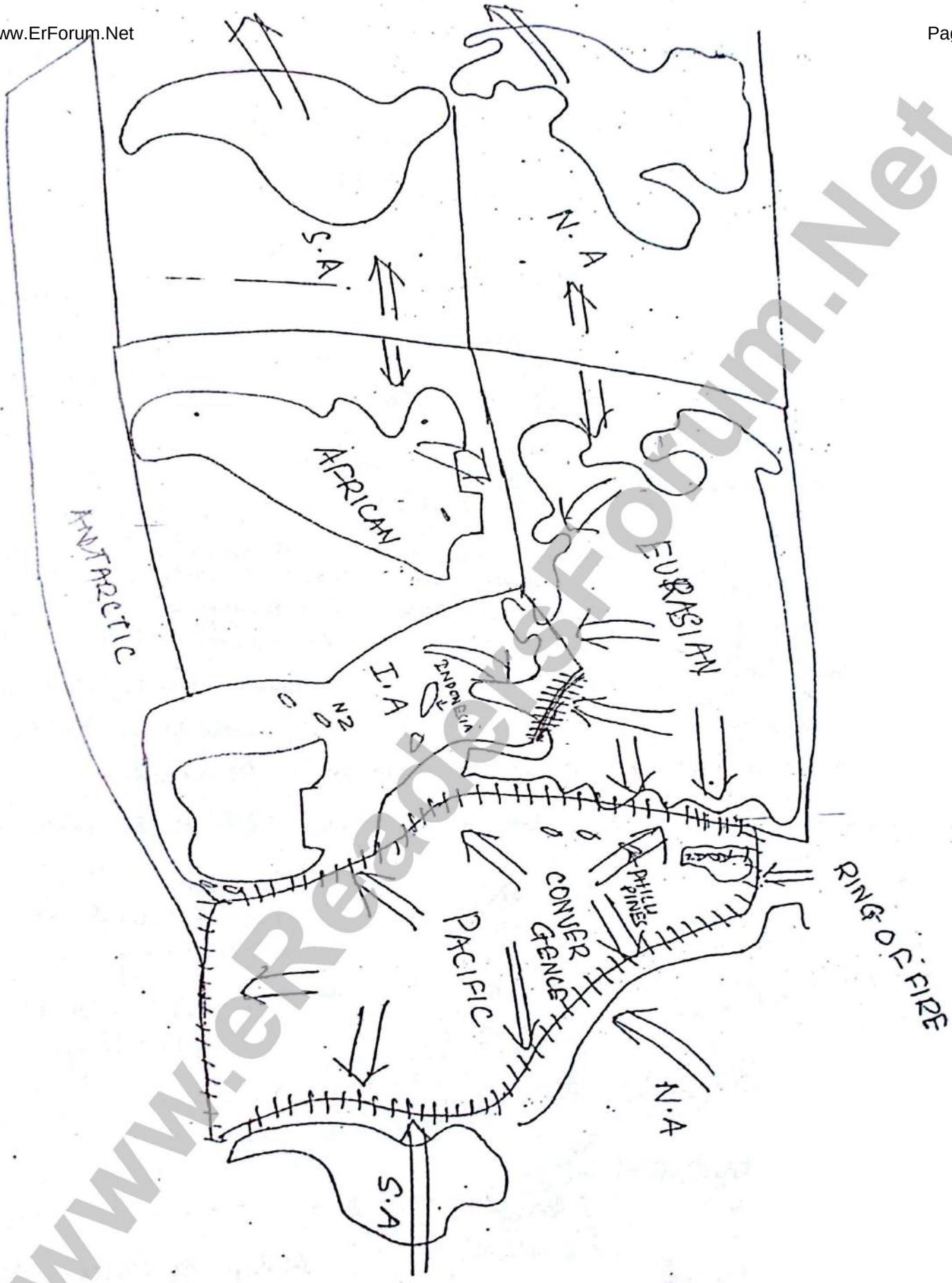

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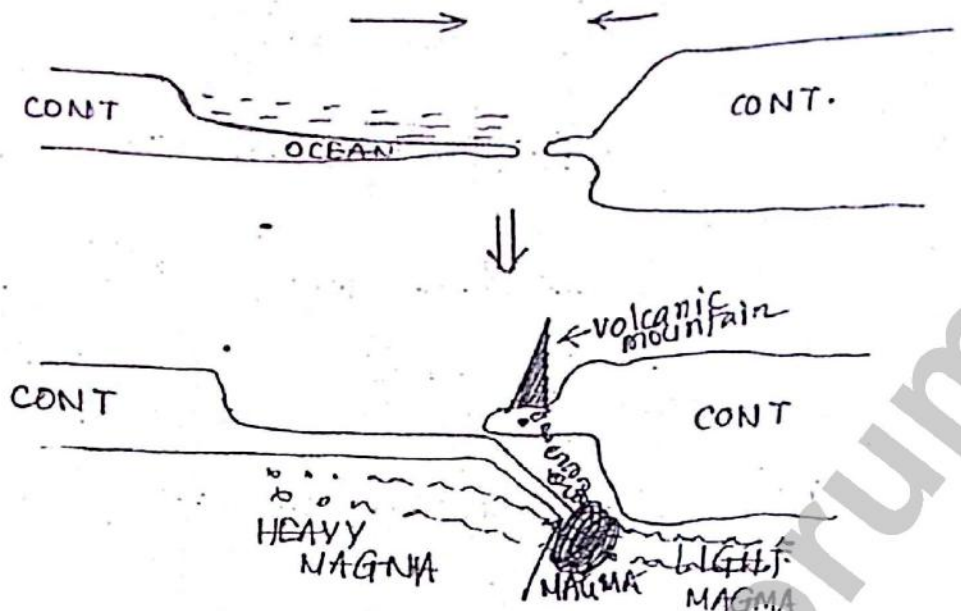
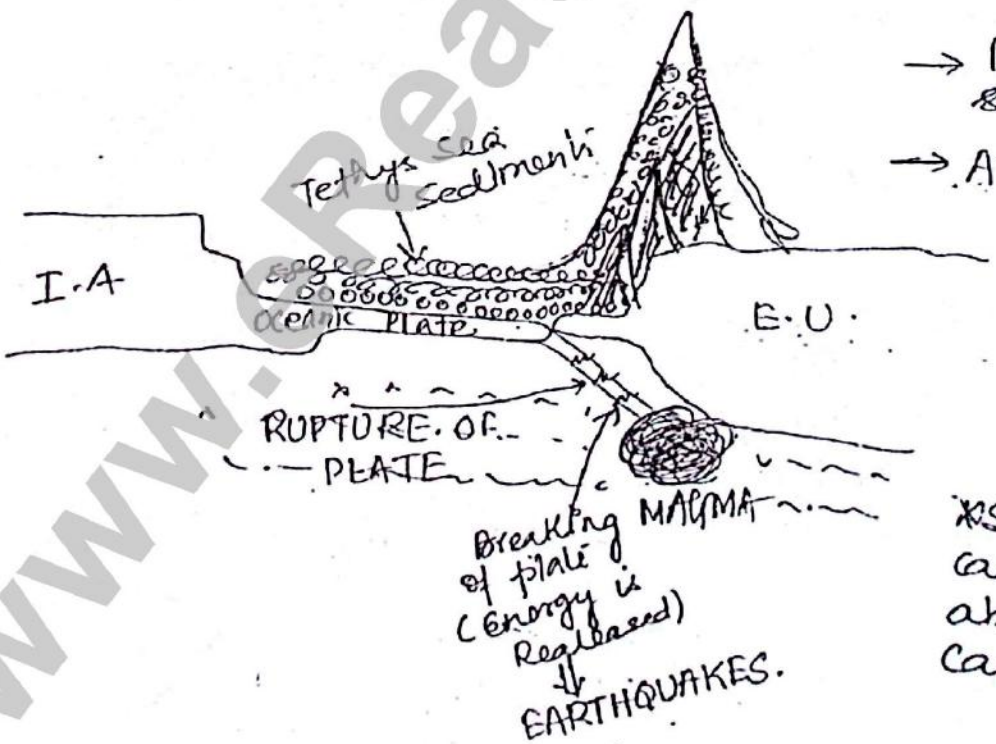


oceanic heavy goes ~~deeper~~ to region of 1500°C and melts and forms Magma and comes out to form VOLCANIC FORMATION.

In the case of Indo-Australian & Eurasian Plate, when TETHYS SEA was present, the process of VOLCANIC ERUPTION took place and volcanic mountain was formed.

As there is no tethys sea, there are no volcanic Eruption.



→ PACIFIC SEA is shrinking

→ ATLANTIC SEA is expanding.

Slip of Plates also causes jerk in the above plate and causes EARTHQUAKE

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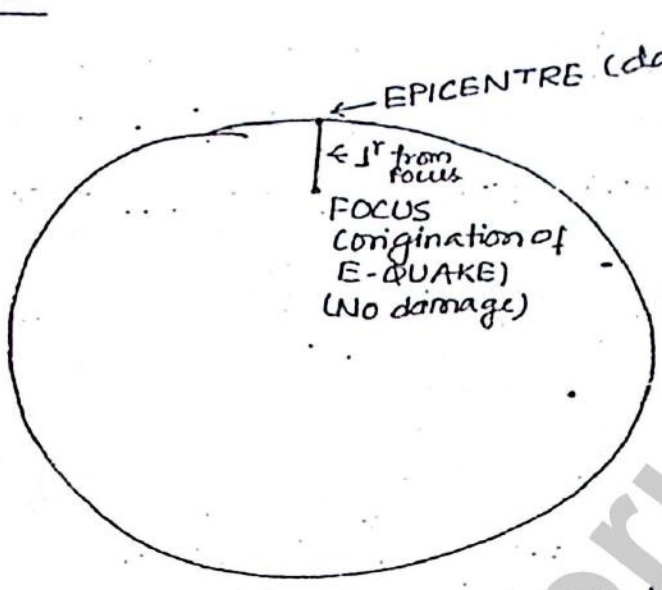
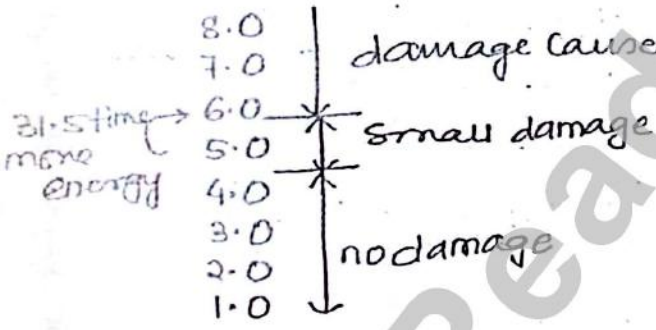
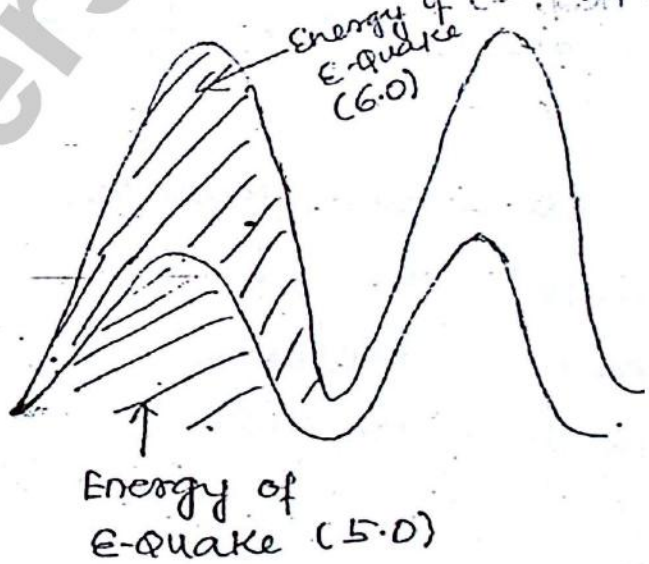
* EARTHQUAKE :-



* RICHTER SCALE – used to measure the intensity of E-Quake.
(0 – 10 – ∞) → Practical Range (0–10).
Range

* Another instrument is MODIFIED MERCALLI SCALE.





* 1960 → 9.5 RICHTER → CHILE.
(Most Powerful E-Quake)

26 Dec – 2004 → SUMATRA, INDONESIA → 9.3 RICHTER.

11 March – 2011 → JAPAN → 9 RICHTER.

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TSUNAMI:

* Giant and fast wave.
* Height may be approx 100 ft
* Speed may be about 800-900 km/hr.
* Called as DEADLIEST NATURAL DISASTER on 26 Dec-2004. till date.
* occur when Earthquake occurs near coastal Area, and E-Quake event records a Richter scale of 7.0 or greater.
* Nuclear Disastor took place in Japan (Fukushima).

massive volcano emuption / metaroid falling in oceans also causes Tsunami.

* In India, most powerful earthquake occured in ASSAM.
  - → 15 AUG, 1950 — ASSAM (8.7)
  - 26 JAN, 2001 — BHUJ (8.3)

* On the basis of seismicity, India can be divided into 4 categories.

1) Zone V — very high Risk.
2) Zone IV — high Risk.
3) Zone III — moderate Risk.
4) Zone II — no Risk.

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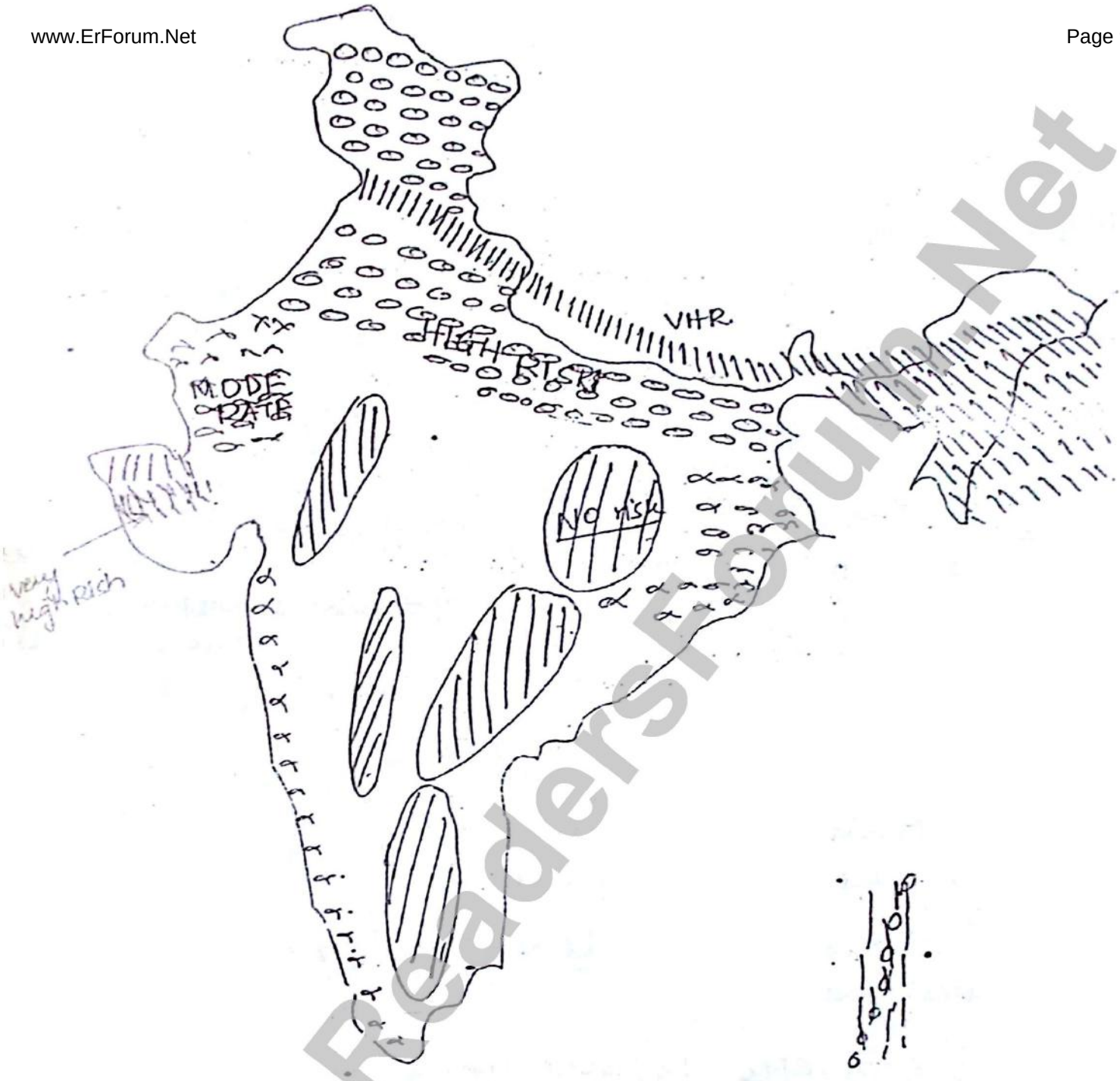

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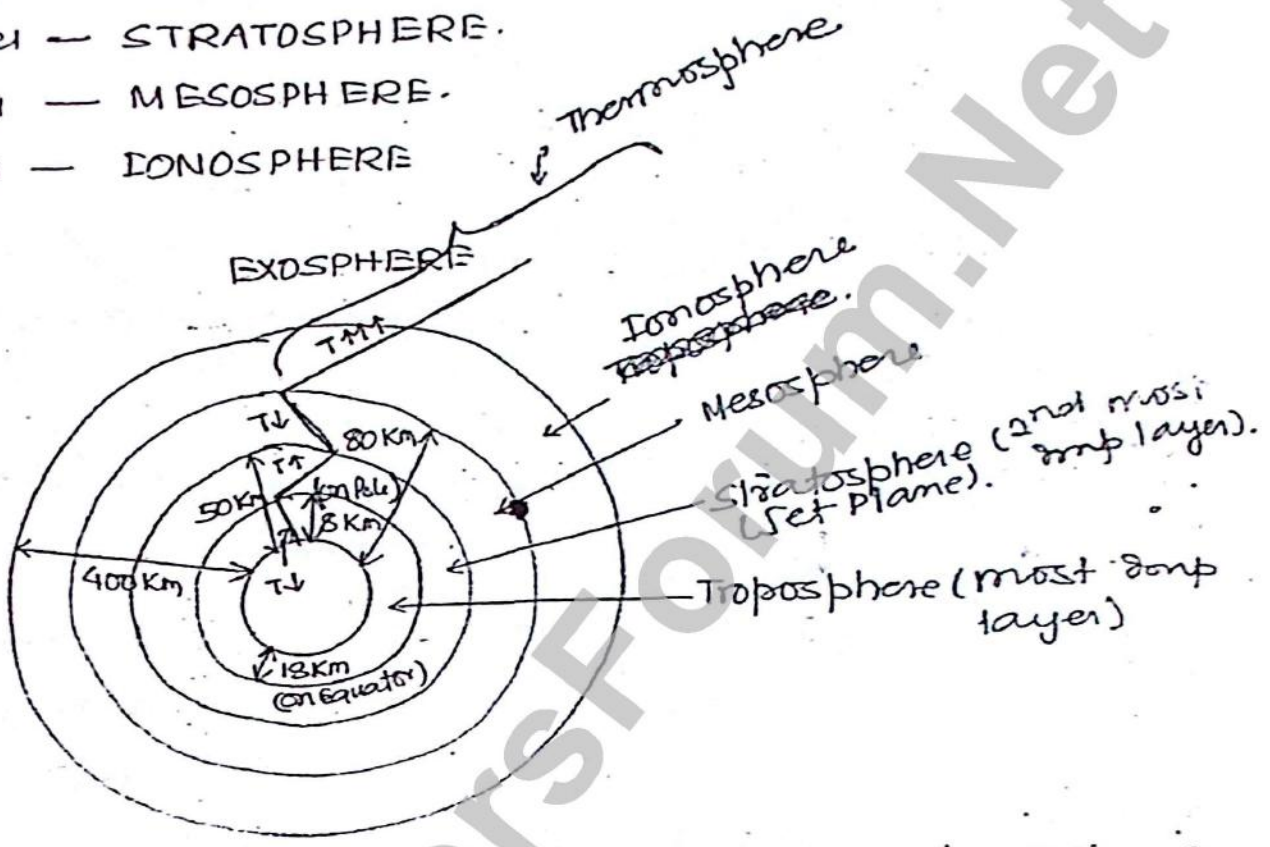
ATMOSPHERE / CLIMATE:-

- 1st layer — TROPOSPHERE.
- 2nd layer — STRATOSPHERE.
- 3rd layer — MESOSPHERE.
- 4th layer — IONOSPHERE



For Reaching certain height, there is large change in the temp. Hence the layers are decided.

Ozone is in the stratosphere and it absorbs the UV rays of sun and hence Temp ↑.

Greenhouse gases (CO_2, CH_4, CFC) are heavy gases and are concentrated near the Earth surface. As the height increases, the concn of these gases decreases and hence Temp ↓

In Ionosphere, the temp ↑ due to proximity to sun.

Most disturbed layer (most variation) is Troposphere. Here, cloud, formation, Rainfall, Cyclones took place.

Jet Stream/Jet Aircraft Boeing:-

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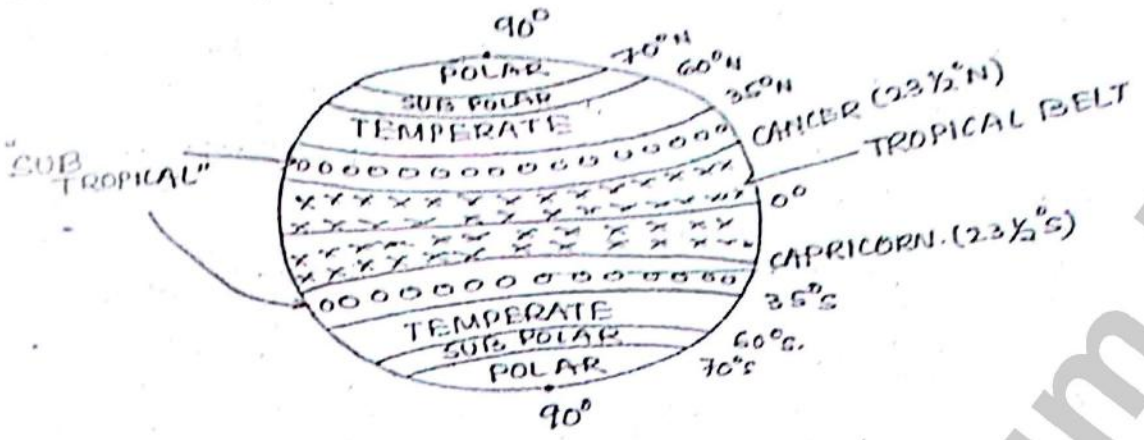
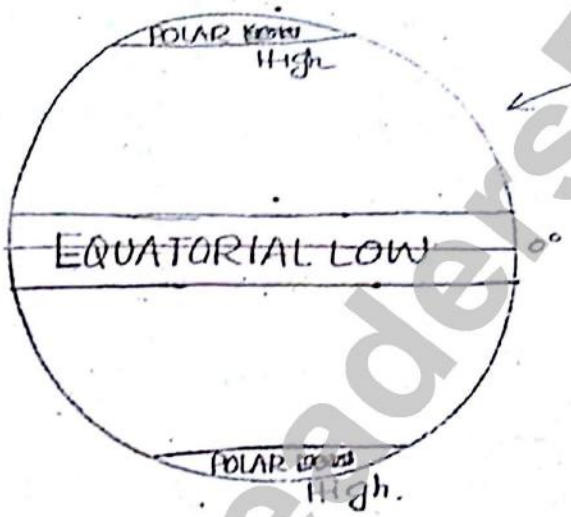
Temperature Belt:

* Total 9 Temperature Belts are present



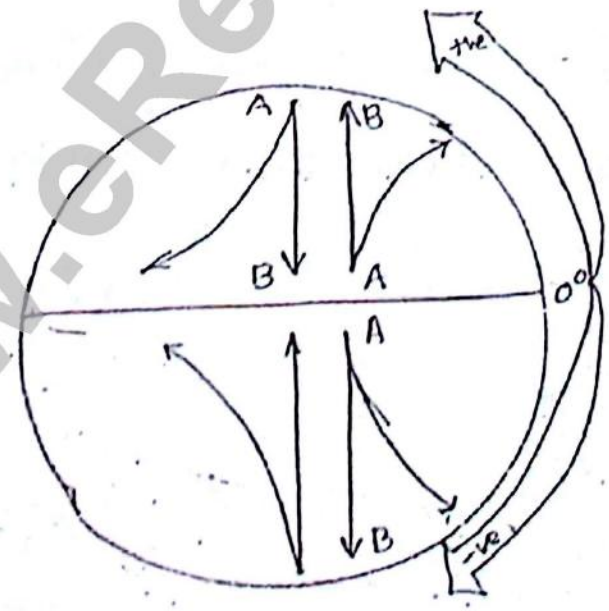
* Temp. decreases as we move to Polar Regions.

* Temp $\propto \frac{1}{\text{Pressure.}}$ (Volume Const.)

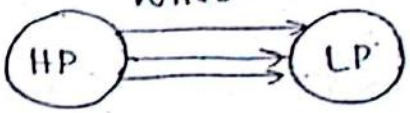


*WINDS:

A → starting
B → End.



(Pressure gradient force).
↓
WIND.



*CORIOLIS FORCE: also causes wind, this is caused due to the Rotation of the Earth.

*When wind goes from HP to LP, the wind moves right hand side due to Coriolis force. in Northern Hemisphere and towards left hand side in Southern Hemisphere.

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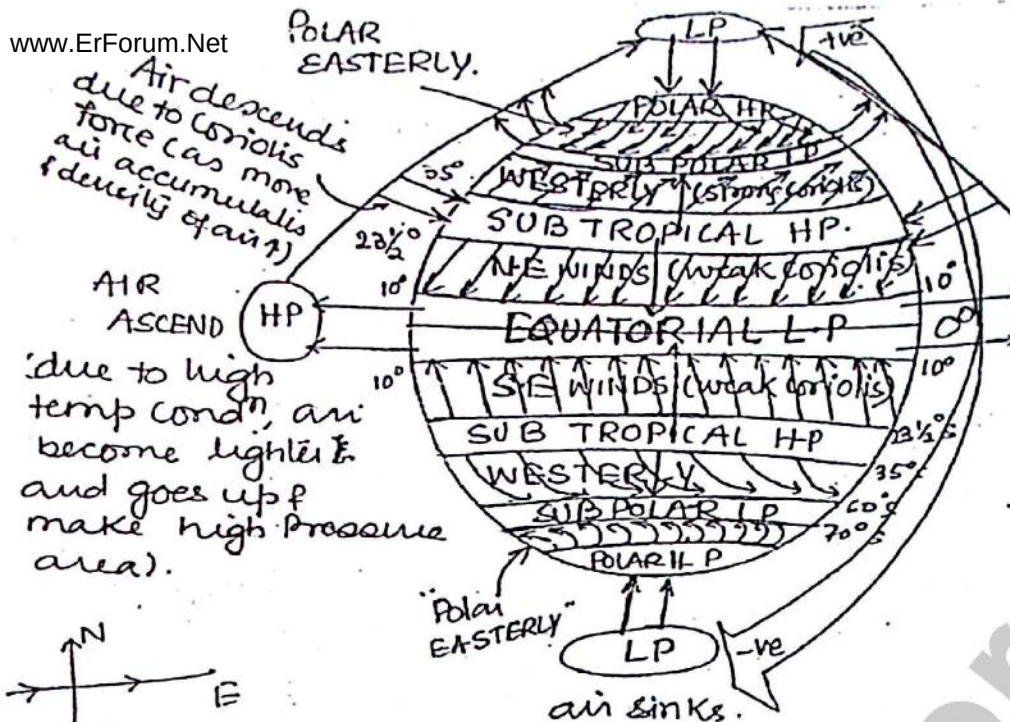
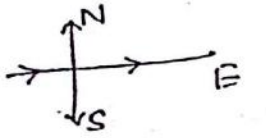
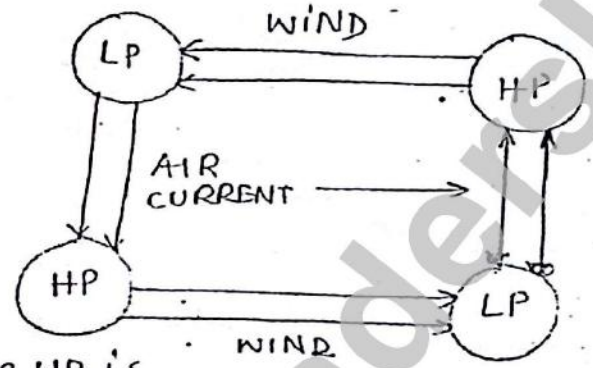


As Earth is rotating hence it will be having angular momentum, given by m.r.w



ue to strong oriolis force nce bending



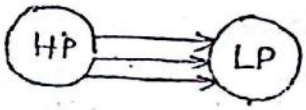
(above HP is LP area)

(above LP is HP area).

*Air descends from the polar areas, but while coming down, the air is lighter and hence it further Rises. The areas are called as Sub Polar area.

In total. 7 Pressure Belts are available.

Pressure Gradient Force



Coriolis Force (angular Force) → due to Circular motion of Earth

All hot deserts lie in SUB TROPICAL HIGH PRESSURE BELT.

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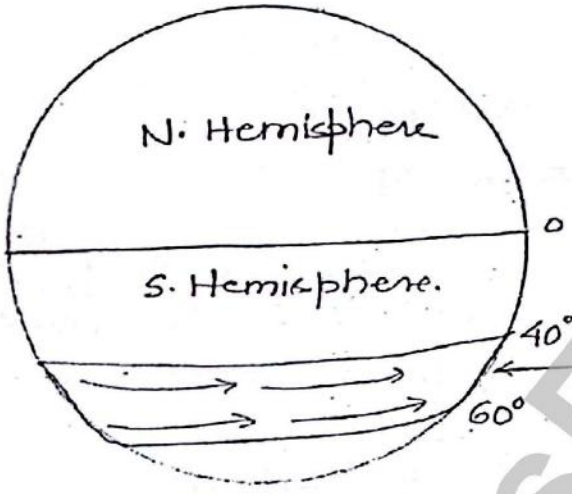
* GLOBAL WINDS / PLANATERY WINDS:

- → Polar Easterlies (60°-90°).
- → Westerlies (30°-60°).
- → N-E Tradewinds (0°-30°).
  S-E Tradewinds (0°-30°).

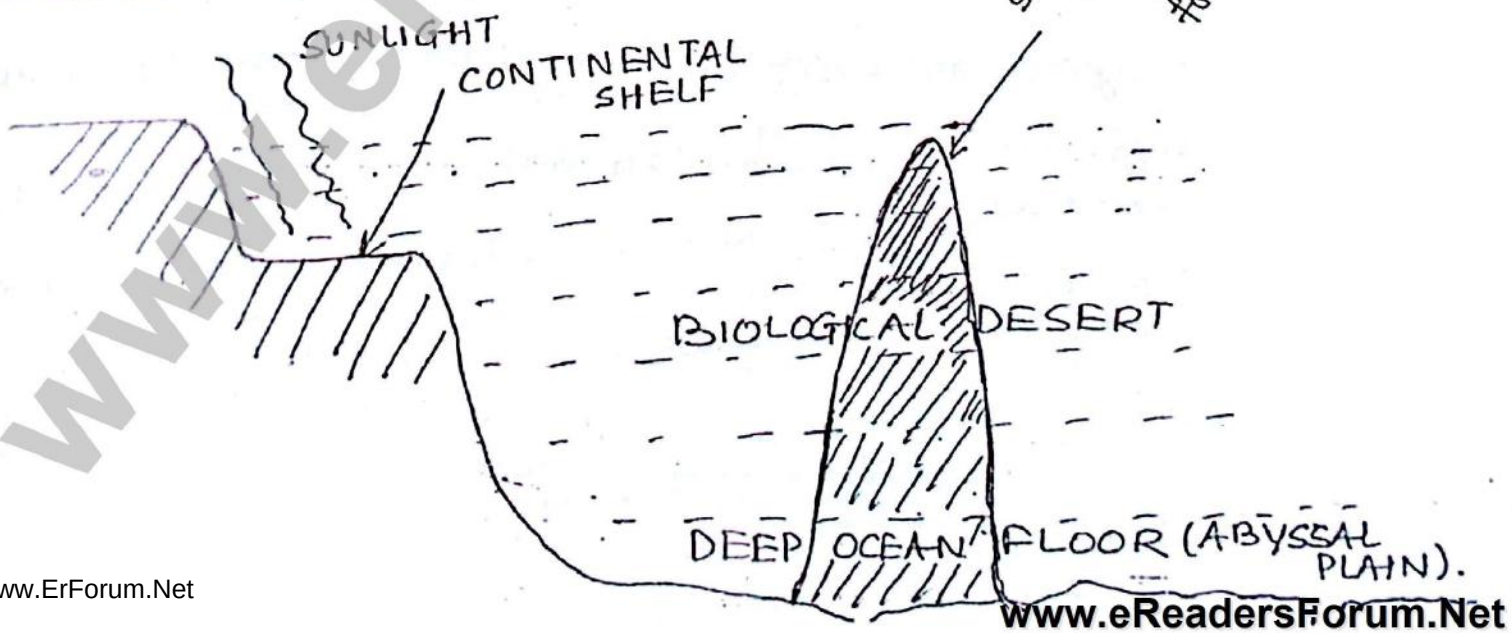


No landmass available in southern Hemisphere. Hence they gain very high speed.

* In the 40°-60°, the names given to these winds are:

westerlies of 40°S → ROARING FORTIES
" " 50°S → FURIOUS FIFTIES
" " 60°S → SHRIEKING SIXTIES

* HYDROSPHERES / OCEANS:


SUNLIGHT
CONTINENTAL SHELF
SUBMARINE MOUNTAIN/OCEANIC RIDGE (Feature of Atlantic & Indian Ocean) formed due to volcanic eruption.
BIOLOGICAL DESERT
DEEP OCEAN FLOOR (ABYSSAL PLAIN).

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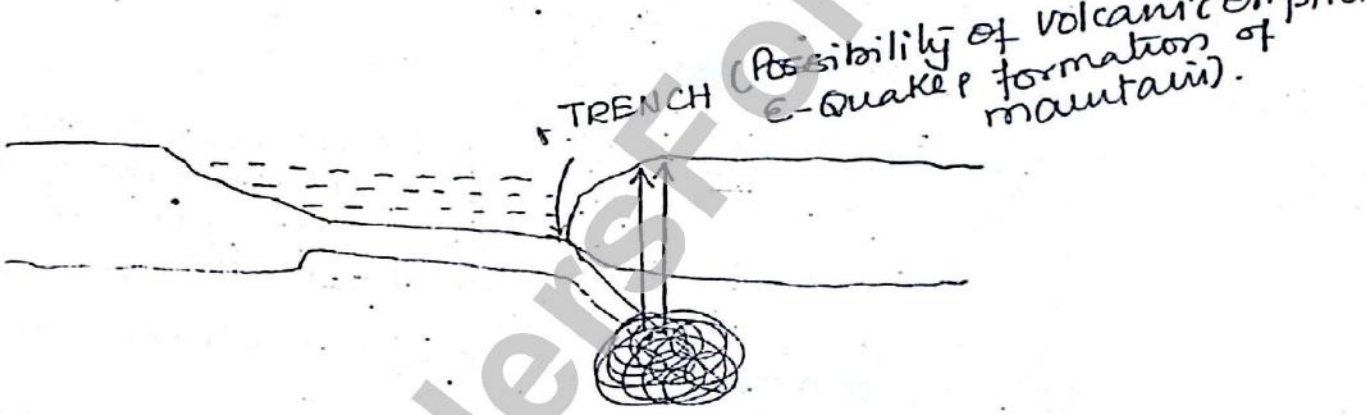
Continental shelf,

a) Closer to coastal areas.
b) Process of Photosynthesis, as sunlight can penetrate.
c) Rich Biodiversity (Fisheries).
d) availability of Fossil Fuel. (Bombay High).

Deep portion of Deep ocean is called as TRENCH
deepest Trench is MARIANA TRENCH
deepest ocean is PACIFIC OCEAN.
PACIFIC OCEAN has maxm no. of trenches.



: Oceanic Ridges are formed due to Volcanic Eruption and formed due to divergence of Plates.

Ocean water is moving and these movements are called as following:

1) SEA WAVE (local and highly uncertain).
2) TIDE (systematic & regular in nature).
   - 2 high tide
   - 2 low tide
   } in 1 day (24 hrs).
3) OCEAN CURRENTS.

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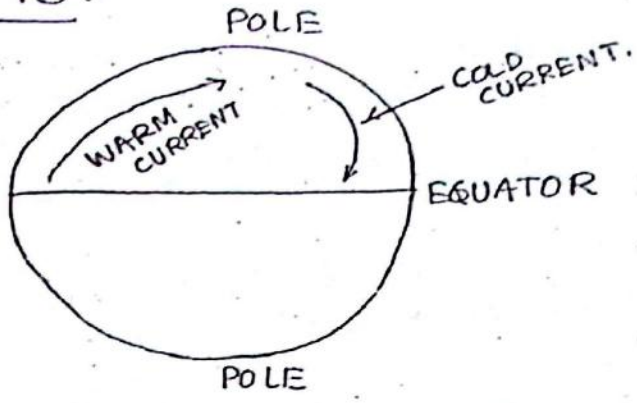
OCEAN CURRENTS:



*Along coast of Afosca, Cold current flow (CANARY), which has no moisture, hence no cloud formation and hence no rainfall. so, SAHARA DESERT (Dryiest Desert).

* If any cold current flows along the weslen coast of the continent then there will be HOT DESERT.

* cold current + warm current → Fog formation

*Densest fog formation in sea is that region where LABRADOR & GULF STREAM meets.

→ not suitable for navigation
→ meeting of these current, deposit nutrients, Planktons are developed.
→ To consume Planktons, hence more Fishing.

*These areas are called GRAND BANK.

* Peruvian current is cold current, but due to Global Warming the cold current of Peru changes to warm current. This phenomena is called "EL-NINO" ← Remains for 1 year (in Peru) starts (25 Dec)

* warm current — moisture — High Rainfall (Peru)
↓
causes less Rainfall (Indian coast)

* The above phenomena occurs after 5 to 8 years.

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* After some time, the cold current starts flowing along Peru. But it sometimes very cold. These changes in Peruvian current called FLOOD like cond? in INDIA. The above changes is called "LA-NINA".

EL-NINO } "Disastrous situation for India"
LA-NINA }

* Indian Ocean → no cold current found. (only)
  * current changes their direction twice according to monsoon wind.
    (SOMALI CURRENT)
    (only current).

CLOUD:

: Temp and Relative Humidity are Inversely Proportional

$$\text{Temp} \propto \frac{1}{\text{R.H}}$$

As surface of Earth heats up, the air expands and rise up. As temp decreases, when height increases, also if Temp ↓ and R.H ↑. when R.H becomes 100%., then the process of condensation starts and hence cloud formation takes place.

These clouds cause Rain (to shed their weight).

Critical temp. at which condensation starts is called as DEW POINT.

Dew Point > 0° = Rain

Dew Point < 0° = Snowfall.

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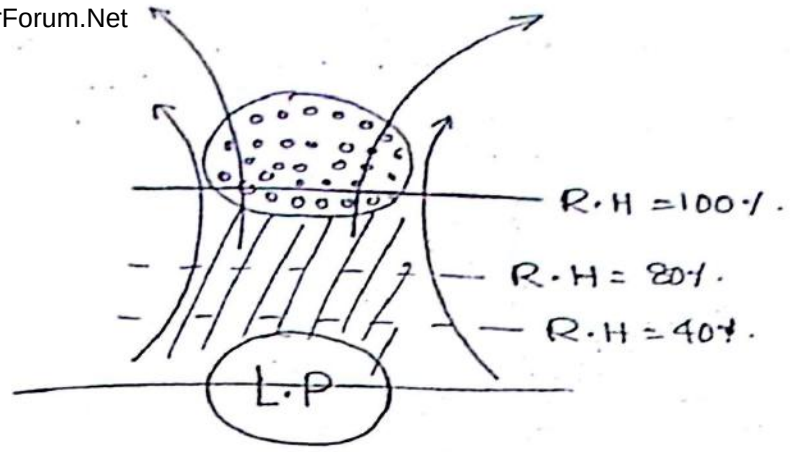
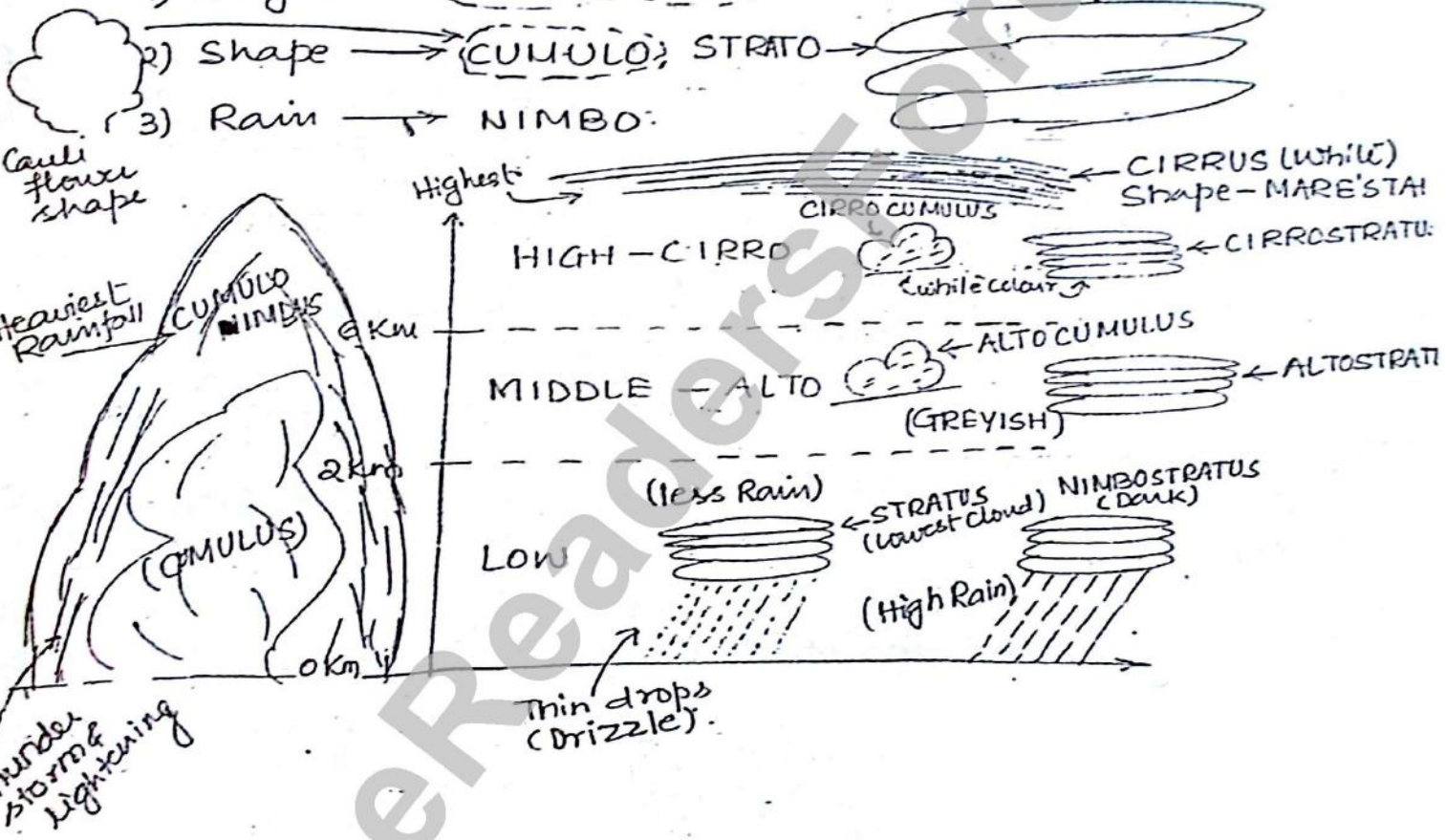


*Clouds are classified on the basis of:-

1) Height → very High: CIRRO; high: ALTO
2) Shape → CUMULO; STRATO
3) Rain → NIMBO.



*RAINFALL:-

PRECIPITATION:-
- → Rainfall.
- → Snowfall.
- → Hailstone. → due to excessive heating of earth surface, the heated air is bound to ascend very high and hence first of all Rain forms, then ice is formed and its weight ↑ and then it falls.
- → Sleet.
  - ↓
  - Rainfall along with Snowfall

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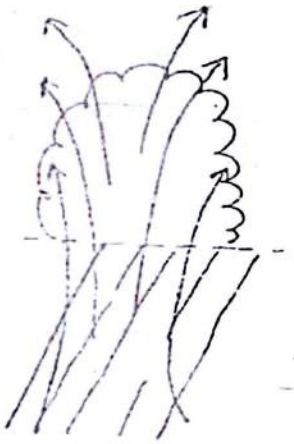
CLOUD BURST:

Excessive Rain during short span of time causing flood like cond^{n} for short time. These flood is called FLASH FLOOD

* occurs in:
  1) J&K
  2) HImachal
  3) Uttarakhand.

Rainfall:

- CONVECTIONAL
- OROGRAPHIC
- CYCLONIC

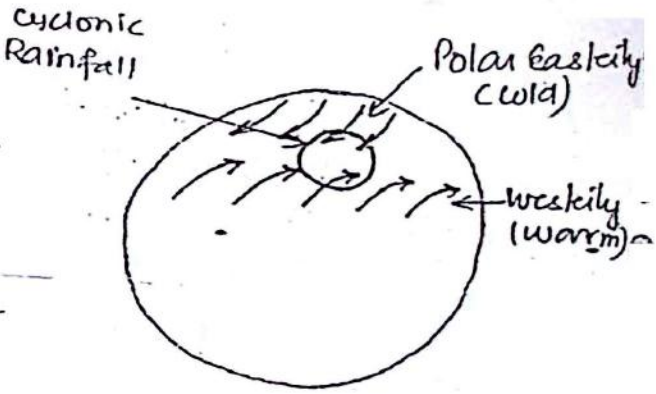


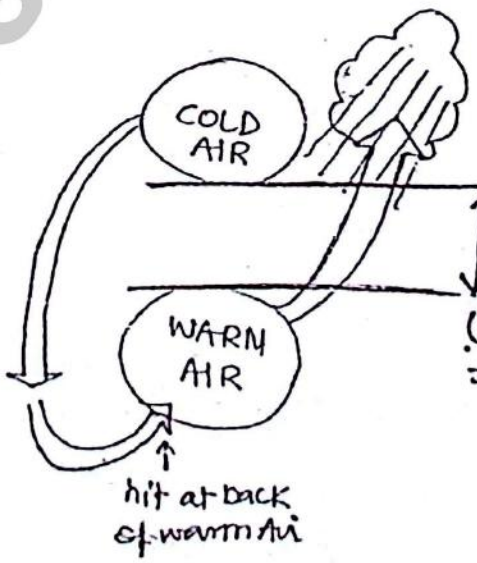
(to support Normal Rain)

along western side, N.E Region.

→ supported by ocean and mountain

* Related to Temperate and polar countries.
* western Disturbances are called as CYCLONIC RAINFALL.





(Front b/w cold & warm air)
(Both have diff. characteristic they don't easily mix up)

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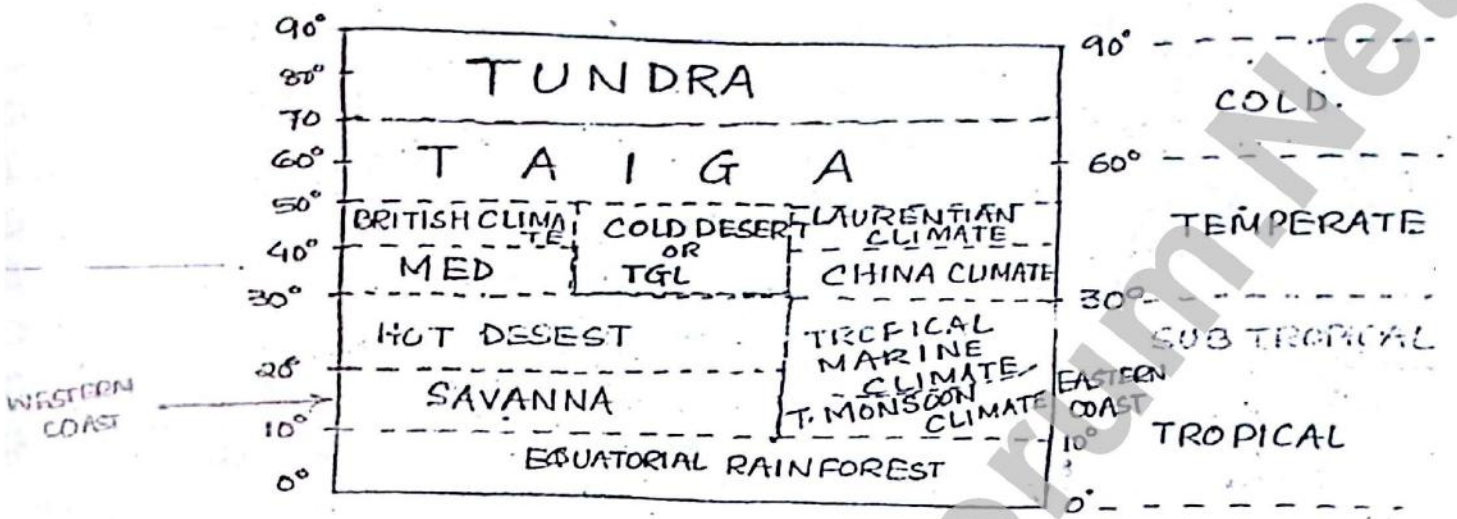
*World Geography:

NATURAL REGION / CLIMATIC REGION



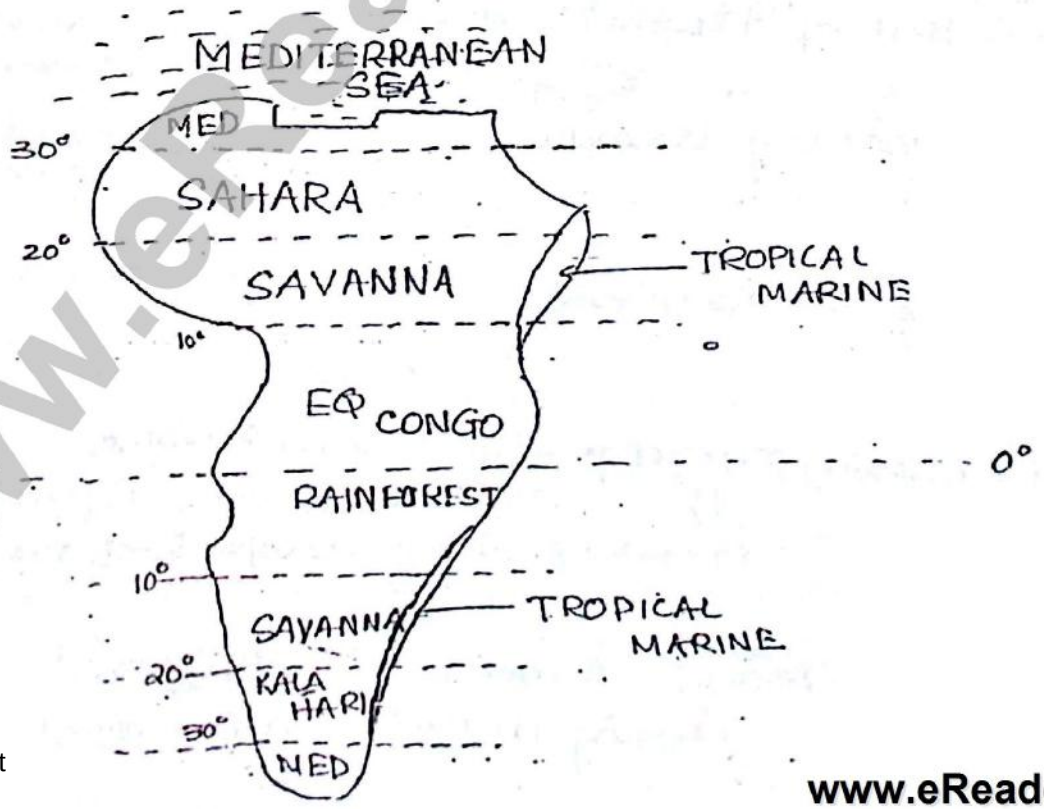
* SAVANNA → TROPICAL GRASSLAND.

* MED → MEDITERRANEAN CLIMATE.

* TGL → Temperate Grasslands

* Laurentian climate → climate of Newyork, parts of Asian Russia

*AFRICA:



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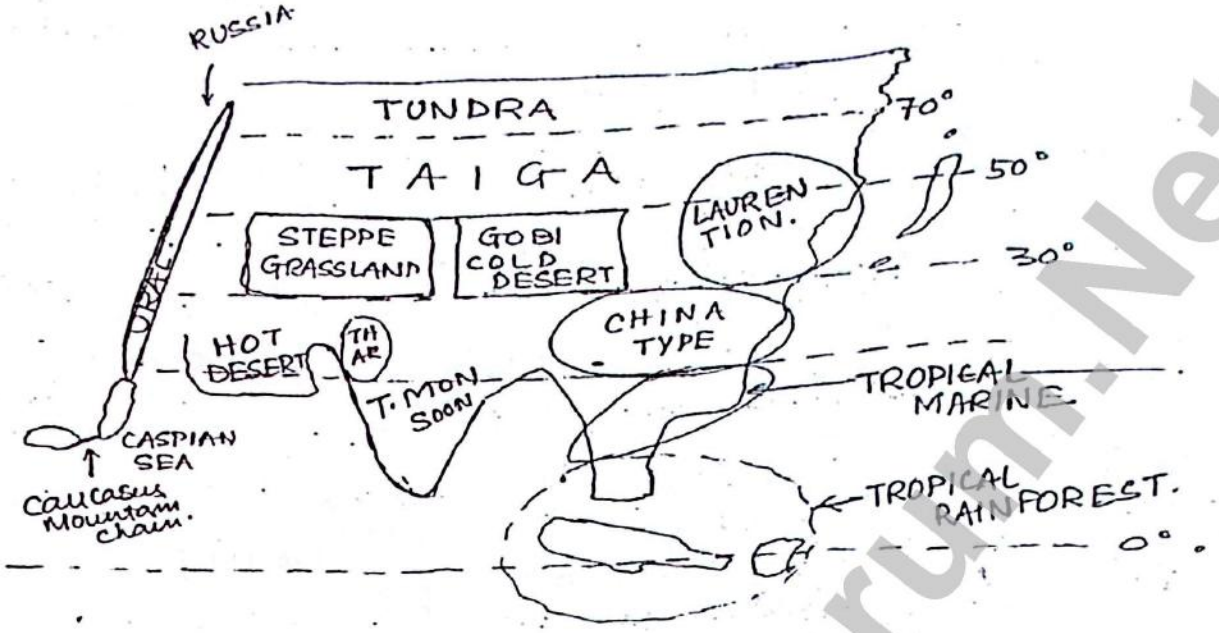
*ASIA :-



ASIA :-

Area ↑↑ ; Population ↑↑ ; Population density ↑↑

* Total no. of countries = 48.

*URAL MOUNTAIN → natural boundary b/w ASIA & EUROPE.
&
CASPIAN SEA
& CAUCASUS MOUNTAIN.

* BLACK SEA – is part of ATLANTIC OCEAN.

* SUEZ CANAL :- making boundary with AFRICA & ASIA.
(EGYPT)

· EGYPT & RUSSIA lying in 2 continents
SUEZ CANAL · URAL

other than Egypt & Russia, TURKEY also lies in Europe.
⇓
ISTANBUL lie in Europe, Rest in Asia.

(CAUCASUS countries → Georgia, Armenia, Azerbaijan,
(lying in Both Asia & Europe)

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- PAMIR & TIBET → Called as Roof of World

Hindukush - Border line Pakistan & Afghanistan

* TOROS (TAURUS) — TURKEY

* ZAGROS — IRAN

RIVER :

(origin - Tibet) → Central Mountainous Region Gobi

YANGTZE — longest River of ASIA (3rd world wide)

YANGTZE → longest dam worldwide (CHINA) (THREE GORGES DAM) (China - no. 1 in HEP) — (22,000 km)

* HUANG HO — SORROW OF CHINA (Yellow River) → (Chinese Civilization)

South Asia

* MEKONG (origin CHINA) (Passing through large no. of countries)

- China
- Cambodia
- Indonesia
- LAOS
- VIETNAM

→ also called as DANUBE OF ASIA

* DANUBE - Passing through most Countries

* LENA (RUSSIA)

YENISEY

OB

* Persian Gulf (Lifeline of Middle East)

IRAQ

TWO { TIGRIS, EUPHRATES } ← Related to MESOPOTAMIA CIVILISATION (draining to Persian Gulf)

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Lakes:

CASPIAN SEA — largest lake in woold
- → a lauge Peliolcum depot took place
- → surrounded by RUSSIA, KAZAKASTAN

* BAIKAL LAKE → deepest lake in wodd (RUSSIA)

* ARAL SEA → Kazakastan & Uzbekistan. (lake).

DESERT :
- → HOT
- → COLD.

* RUB AL KHALI - Saudi Arabia
  THAR — India & Pakistan. } HOT DESERT

* GOBI — Mongolia
  TAKLA MAKAN — China } COLD DESERT.
  LADAKH — India.

NORTHERN ASIA → RUSSIA

CENTRAL ASIA → except Pakistan & Afghanistan (KAZ, KYR, TAJIKIS, UZBEK, TURKMEN)

SOUTH ASIA → INDIA (SAARC GROUP)

EAST ASIA → CHINA, JAPAN, S-KOREA, N. KOREA. MONGOLIA, TAIWAN.

WEST ASIA → Middle East/Gulf countries

SOUTH EAST ASIA → Indonesia, Malaysia, Thailand, Vietnam. (ASEAN GROUP)

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*Asian Part of Russia — Cold Part → SIBERIA.
Energy Mineral "PETROLEUM"

SIBERIA → TUNDRA & TAIGA OF ASIA.
(RUSSIA).

* coldest Part of SIBERIA → VERKHOYANSK (-68°C)

* Coldest Part of world — ANTARCTIKA (-89°C)
VOSTOK

Worldwide Area of Country :-

*1. RUSSIA.
2. CANADA.
3. CHINA.
4. USA.
5. BRAZIL.
6. AUSTRALIA.
7. INDIA.
8. ARGENTINA.
9. KAZAKASTAN.
10. ALGERIA.

Population wise

1. CHINA
2. INDIA
3. USA
4. INDONESIA
5. BRAZIL
6.

* KAZAKHSTAN → largest land locked country worldwide.
"URANIUM"
"PETROLEUN"

* CHINA
RUSSIA
KAZAKHSTAN
UZBEKISTAN
TAJIKISTAN
KRYGYSTAN

SHANGHAI - 5
COMMITEE
(made by initially China to exploit Petroleum & uranium of Kazakhstan).
(only Turkmenistan is Part)

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SOUTH ASIA:

1. INDIA
2. PAKISTAN
7. BHUTAN.
8. MALDIVES

Both Area & Population.

B'desh, Srilanka, Afg., Nepal.

* KARANCHI → no.1 city of Pakistan.
DHAKA → no.1 city of B'desh.
COLOMBO
KATHMANDU.

* Neighbouring countries of India & their famous city.

* KHYBER, GOMAL, BOLAN PASSES in Pakistan (Hindukush mountain)

* PIDRUTALAGALA — highest peak of SRILANKA

EAST ASIA:

1. CHINA

: JAPAN is only developed country of ASIA (member of G-8)

Populaily decreasing.
-ve population growth.

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* South Korea giving tough competition to Japan.
  - steel sector (POSCO steel)
  - electronic sector (LG, samsung / Sony).

* least developed country - MONGOLIA
  least Population density - 2 Person / sq.km.

*WEST ASIA:

dominating country

Area	Popⁿ
1. SAUDI ARABIA	1. IRAN

* other than Saudi Arabia, IRAN, ISRAEL is technologically far more better than countries of west ASIA.

* ISRAEL — Best irrigation (90% of Area is Desert). (Drip irrigation)

* MUSLIM → SIYA (① IRAN, ② IRAQ) → maxm SHIA Popⁿ)
  → SUNNI (dominant)

*SOUTH EAST ABIA:

* Dominating countries:
  1) INDONESIA.
  2) MYANMAR.

* ARAKAN YOMA — mountain chain in MYANMAR close to Indian Border.

* IRRAWADY — Imp. River of Myanmar.

* maxm no. of Popⁿ, Island, Volcanoes, E-Quake — 1. INDONESIA.
  Worldwide 2. JAPAN.

* LAOS land locked country

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AUSTRALIA :-

* Called as Continental Island.
* Smallest continent in world.
* Year of discoverd → BRITISH CAPTAIN COOK in 1769
* Britishers sent only Criminal Background people to AUSTRALIA
* Population → 2 crore.
* Basically 6 state.

astal ities.	Perth →	Western Australia
	ADELAIDE →	South Australia
	BRISBANE →	Queensland
	1. SYDNEY →	New South wales
	MELBOURNE →	Victoria
	HOBART →	Tasmania

Northern Territory is just like Chandigarh.

* Capital — CANBERRA (New South wales)
  - → less popⁿ
  - → away from Coast

* Territory of Australia
  - → Northern Territory
  - → CANBERRA

Area.
west Australia

Popⁿ
New South Wales.

* least Area & Popⁿ — TASMANIA.

* TROPIC OF CAPRICORN Passes. (weather opp. to India).

Consist of dry land :- ← dryiest continent worldwide.
- → GREAT SANDY DESERT
- → GIBSON "
- → GREAT VICTORIA "

} 3G of AUSTRALIA.

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* Two Rivers in AUSTRALIA
  - MURRAY
  - DARLING (Tributary of MURRAY).

* only 1 mountain chain is present called as the GREAT DIVIDING RANGE.

* AUSTRALIA & ANTARCTICA — completely isolated → complete diff wildlife.

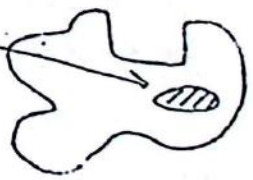
* KANGAROO, KOALA BEAR } Together called as MARSUPIALS. (Pouches to keep babies).
  - lives on (EUCALYPTUS)
    - planted in India, proved disastrous. as the area where it was planted, the water table gone down considerably

* DINGO → brought from EUROPE. (wild dog)

* PLATYPUS → characteristics of Mammal, Birds & Reptile
  - SHY

* KOOKABURRA → Famous Bird of AUSTRALIA

* Temperate Grassland in AUSTRALIA
  - CHERNOZEM ← most fertile soil in world (found in Downs of AUSTRALIA).



* MERINO SHEEP → Cattle Rearing in downs of AUSTRALIA

* ABORIGINIES → Tribal Group of AUSTRALIA

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NEW ZEALAND:

* Mountainous Region
* young mountains.
* MAORIS — Tribal of New Zealand.

ale
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EUROPE: ← It has 49 countries.

* Europe is greater than AUSTRALIA only.
* It is a peninsula, surrounded by water on three sides.
  * ARCTIC OCEAN
  * ATLANTIC OCEAN
  * MEDITERRANEAN SEA

* Russia
  Georgia
  Armenia
  Azerbaijan
  Turkey
  } lying in Asia as well as EUROPE.
  ISTANBUL in EUROPE.

* ALPS mountain chain in ← young fould mountain
  * France.
  * Switzerland.
  * Austria.

* Highest Peaks:
  1) MOUNT BLANC (highest) ← France.
  2) MATTERHORN (it is shredding)
     (Switzerland)

PYRENEES mountains — natural boundary b/w France & Spain.

APENNINE mountains — Backbone of Italy.

PENINES mountains — located in U.K (Backbone of UK).

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*CARPATHIAN — Hungary & Romania.

* DINARIC ALPS — Serbia.

* Rivers of Europe:.

1. Longest River is VOLGA (originating in Russia, draining into CASPIAN SEA

2. DANUBE - originating in Germany, draining in BLACK SEA

* Passes through maxm no. of countries (worldwid (Germany, Serbia, Hungary, Bulgaria, Romania Austria).

*RHINE (Germany) — Busiest waterway worldwide

*SEINE (Paris) -

* THAMES (London)

* RHONE (France)

* Political Europe:

1. Northern Europe (Scandinavian countries, Baltic Group.
2. Southern Europe
3. western Europe
4. Eastern Europe

*Northern Europe:

* Scandinavian countries ← oldest mountains (like Aravali)

↓ Norway ↓ Sweden ↓ Denmark ↓ Iceland.

* All these countries have highest HDR (Human development index) Report

* HDR → life expectancy
→ literacy
→ Per capita income.

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* HIMADRI – 1st Arctic Research station of India at Ny-Alesund in NORWAY.

* ICELAND – Known for volcanic eruption.
  ← (Falling on the diverging of plates)
  * the eruptions are calm and cool.
  * only dark clouds formed, causing disruption of flights

Baltic Group :-

↓ Estonia, Latvia, Lithuania.

* These countries got independence from RUSSIA, near BALTIC SEA.

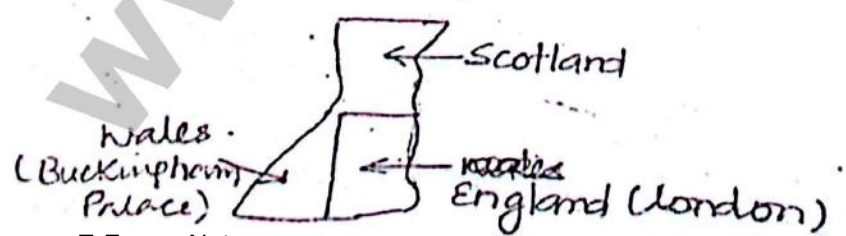
Political Powers, population :-

Powerful :-

1) GERMANY.
2) U.K
3) FRANCE.
4) BENELUX Group
   ↓
   Belgium, Netherland, Luxemborg (Land locked).

* United Kingdom is country
  * Great Britain Part of U.K
    * England Part of Great Britain.

U.K = Great Britain + Northern Ireland



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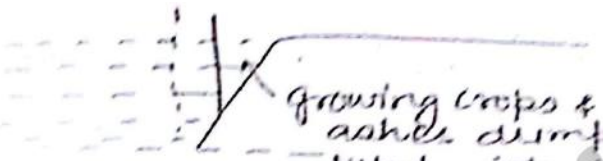
* France & U.K are very close, separated by English channel.
⇅
DOVER STRAIT
⇅
EUROSTAR passing through Dover Strait under the English channel connecting France & U.K.

* Max^m population — GERMANY. (If European Russia is mentioned then it has max^m.

* HAGUE: located in Netherland (Dutchland, Holland) (International court of Justice).

* Known to have acquire land from sea.



growing crops & burning of ashes dumped after it was filled with Ash. The next check dam was built.
Area called as — "POLDER LAND"

* ROTTERDAM → world 3 busiest seaport

* BELGIUM:
Brussels — headquarter of NATO.
* Famous for diamond cutting.
* ANTWERP:- Famous for diamond cutting (worldwide).
→ (in India, Surat, Jaipur, Mumbai).

* SOUTHERN EUROPE:
* most countries got independence, hence political unbalance.
* Countries are:
1) KOSOVO
2) MONTENEGRO.

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* From USSR → including Russia, 15 countries separated from it

* From YUGOSLAVIA — about 6 to 7 countries got independence, and finally only SERBIA left

YUGOSLAVIA – SERBIA

* KOSOVO (latest independent)
* MONTENEGRO
* CROATIA
* SLOVENIA
* MACEDONIA
* BOSNIA
* HERZGOVANIA.

} BALKAN GROUP.

↓

CHRISTIAN & MUSLIMS } Highly diversified.

↓ orthodox ↓ catholic ↓ Protestants

EASTERN EUROPE:

* were first Allies of USSR.
* Famous countries that got independence:
  1) BELARUS
  2) UKRAINE (largest in Europe & also from independent countries from Russia).
  3) MOLDOVA

NORTH & SOUTH AMERICA:-

* South America:-

* major portion lies in S. Hemisphere and some part in N. America.

COLUMBIA connected with N. America.

Equator passing through: 1) EQUADOR.
2) BRAZIL.
3) COLUMBIA.

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*23½°S (Tropic of capricorn) passing through
1) CHILE
2) ARGENTINA
3) PARAGUAY.
4) BRAZIL.

*BRAZIL – Equator & Tropic of capricorn passing through it

* only EQUADOR & CHILE donot share boundary with BRAZIL

* Area & Population - No.5 in world.

* PARAGUAY & BOLIVIA – land locked countries.

*only 12 countries in S.America

* French Guiana (not an independent). – Belonging to FRANCE
↓
KOUROU
↓
launching of INSAT satellites using GSLV.

*VENEZUELA – largest Petroleum depot of S.America.

* Physical :.

* ANDES – longest mountain chain on continent
⇓
ACONCAGUA – highest mountain Peak (Argentina)
highest Peak in S. Hemisphere

⇓
nearer to Pacific Ring of Fire
⇓
largest no. of volcanoes
⇓
* COTOPAXI (Equador)
* OJAS DELSALADO (Argentina)
– highest Active volcano worldwide.

Note :.
SAO PAULO – no.1 city of S.America.

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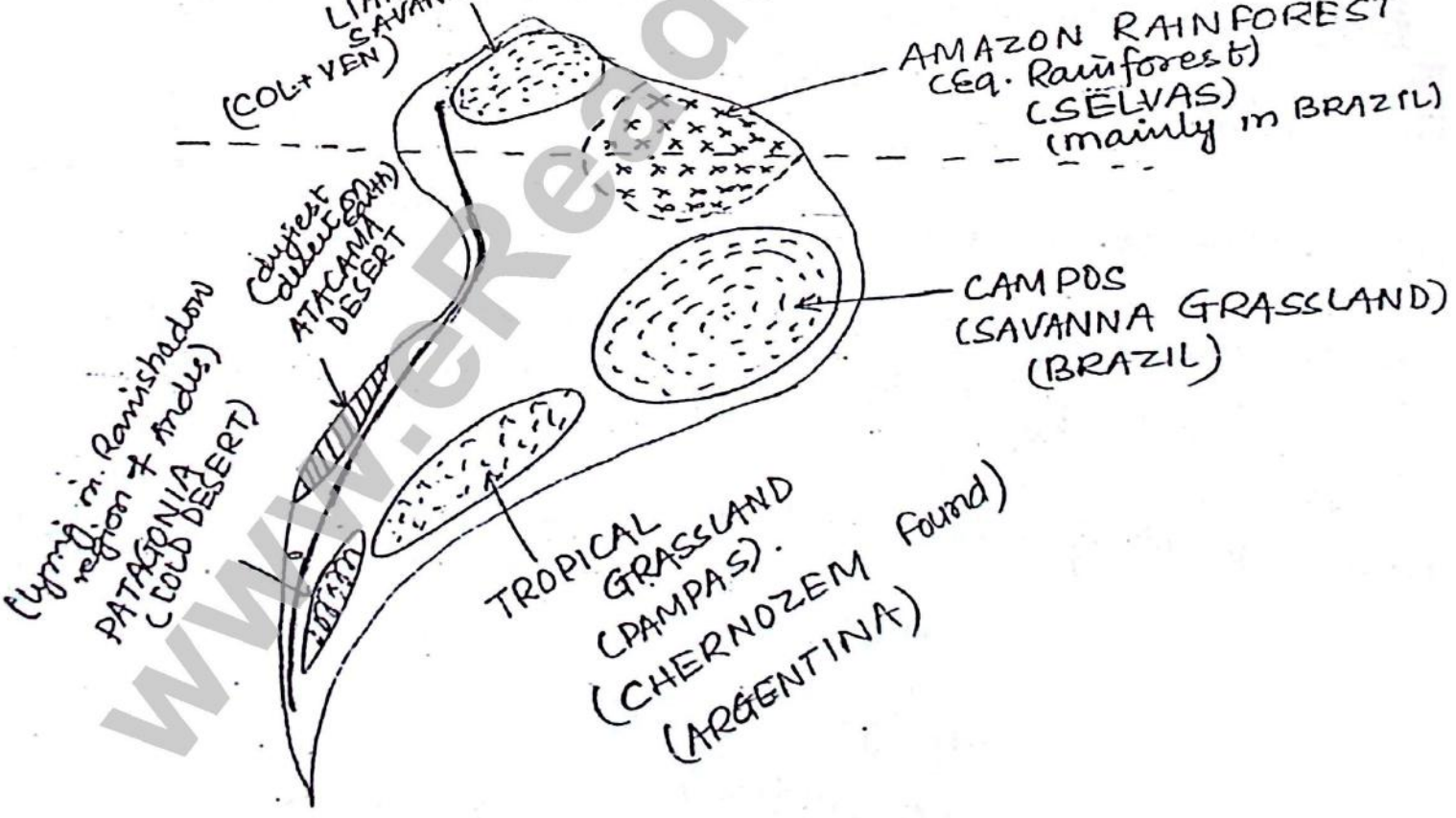
* Rivers:

1. AMAZON — It has largest volume of water (world wide)
   * largest River in world (On terms of volume)
   1. AMAZON 2. CONGO.
   3. NILE. 4. YANGTZE

2. ORINOCO — It has highest water fall (ANGEL WATERFALL) worldwide (Venezuela).

* Lake Titicaca - highest navigable lake (at height)

* Lake Maracaibo — largest lake in South America
  ↳ deposits of Petroleum Reserve (& Venezuela — no.1 in Petroleum due to this)



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* LATIN culture dominating in South America.
  ↓
  latin languages — spanish + Portuguese.

  BRAZIL — Portuguese language
  Rest — spanish.

* S. America → also called as LATIN AMERICA

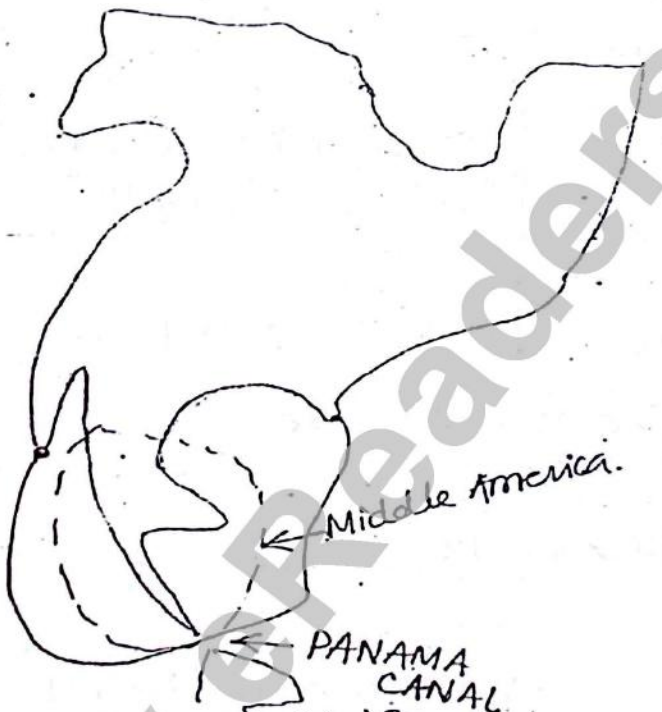
* NORTH-AMERICA:-

* larger than South America.

* LATIN AMERICA → S. America + Middle America.

NORTH AMERICA
- → ANGLO-AMERICA
- → Middle America
- → CARRIBEAN I.S
- → GREENLAND.

Geographically belongs to N.A, but politically Europe — Denmark



* ANGLO-AMERICA:-

* English language speaking countries.

* USA & CANADA

* Middle America:-

* Ranges from Mexico to Panama.

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* Carribean Island:-
  - → CUBA
  - → Dominican Republic
  - → HAITI
  - → Group of Islands → WEST INDIES (Trinidad, Tobago etc) ← Group of Islands which are seperate countries.

* large population of indian origin — WEST INDIES
  CANADA
  USA

USA & CANADA

* 49° N. parallel — dividing line b/w USA & CANADA

* 38° → North Korea, South Korea } dividing line 17° → N. Vietnam, S. Vietnam.

* Group of LAKES :-

* 5 lakes — HOMES of lake

  H → lake HURON
  O → lake ONTARIO
  M → lake MICHIGAN
  E → lake ERIE
  S → lake SUPERIOR } Physical Boundary b/w USA & CANADA

  ↑ largest Fresh water lake Worldwide

* NIAGARA → b/w lake ONTARIO & ERIE (lies in USA & CANADA)

Mt MCKINLEY — highest Peak in ROCKY MOUNTAIN CHAIN. in ALASKA

Rocky Mountain → Volcano → St HELENS

APPALACHIAN MTS → old mountains (Aravalis).

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Rivers :-

1. NILE
2. AMAZON
3. YANGTZE
4. MISSOURI - MISSISIPI (longest of N. America).

* COLORADO → Known to have form deep and large valley
↓↓
GRAND CANYON.

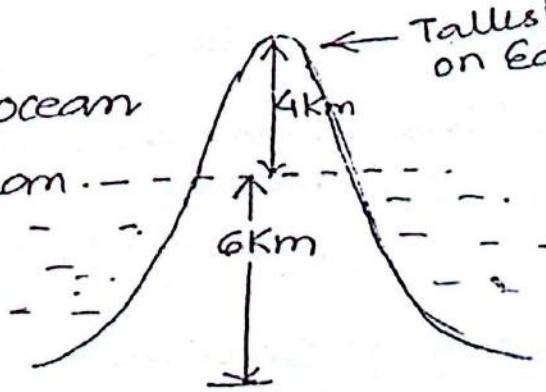
* RIO-GRANDE → b/w USA & MEXICO
* MACKENZIE → CANADA
* ST-LAWRENCE → USA, CANADA Border
↳ 2nd Busiest River worldwide.

USA :-

* 50 states
* Areawise ALASKA is largest
* Population wise CALIFORNIA.
* 50th state of USA → HAWAII ISLAND ← lies on (TROPIC OF CANCER)
↓
Completely volcanic Island.
↓
Most famous Volcanoes are :-
1. MAUNA KEA ←
2. KILAVEA
↳ most Active volcano worldwide.

MAUNA KEA :-

* It is 6Km deep in ocean
* It is 4Km above ocean



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CITIES:

1. MEXICO CITY is no.1 city of N. America.
2. NO.1 city of USA → NEW YORK
3. NO.1 city of CANADA → TORONTO.

CANADA:

* large no. of Indians living.
  - → ONTARIO (TORONTO).
  - → British Columbia.

* ESKIMOS (also called as INUITS).
  - ⇓ Tribal group of CANADA live in.
  - also lives in GREENLAND.

* PANAMA:

* Joining the N. America & S. America.
* separating two large oceans
  - ↓ PACIFIC & ATLANTIC OCEAN.

* PANAMA CANAL - due to it max^m distance is reduced on Earth.

* PANAMA → also called as ISTHUMUS.

Narrow channel of water separating two large land — STRAIT

Narrow land mass separating two land masses — ISTHUMUS

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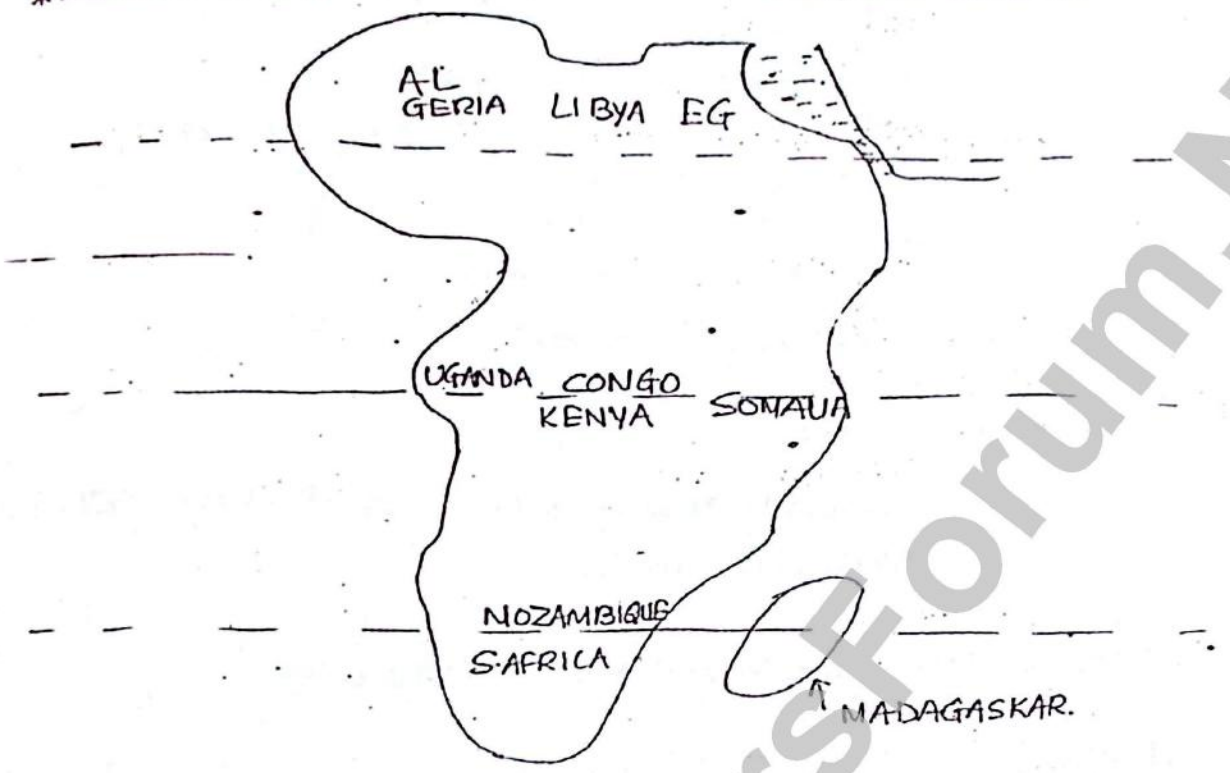
*AFRICA :-

*all m total 56 countries
*Natural Border with ASIA → RED SEA
*manmade " " " → SUEZ CANAL.



* TROPIC OF CANCER, EQUATOR, TR. OF CAPRICORN - all passes through AFRICA only

*Northernmost country - TUNISIA
Southern most " - S. AFRICA
Easternmost " - SEYCHELLES
westernmost " - CAPE VERDE.

*Areawise → ALGERIA.
Population → NIGERIA

*Most Part of AFRICA → Plateau

*MOUNTAIN → North → ATLAS
South → DRAKENSBERG

*Highest Peak → KILIMANJARO ← famous eg. of Extinct Volcano worldwide
(TANZANIA).

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RIVER!.

* NILE → origin from LAKE VICTORIA
  ↳ initially called white Nile
  ⇓
  Blue Nile joins white Nile at KHARTOUM (SUDAN) ← origin of NILE.
  and completely called as NILE
  ⇓
  As passes through Desert
  ⇓
  so less water

* River having more water than NILE is RIVER CONGO and it cuts the EQUATOR twice

* ZAMBEZI — flows b/w ZAMBIA & ZIMBABWE.
  ⇓
  VICTORIA waterfall (largest waterfall of AFRICA).

Note!.

* almost all the countries remained under colonial Rule, hence Backward.
* maxm countries fighting with each other — CIVIL WAR.
* maxm patients of AIDS — 1. SOUTH AFRICA (worldwide).
  2. INDIA.

* famous TRIBES of AFRICA:.
  a) PYGMY ← Congo Rainforest ← (height — 4½ feet) lives on Tree, good hunters
  b) MASAI ← Savanna Grassland (lives in areas of AFRICAN LIONS), they are not hunters but HERDERS, their herd. is called ZEBU.
  c) BUSHMAN ← Kalahari Desert.

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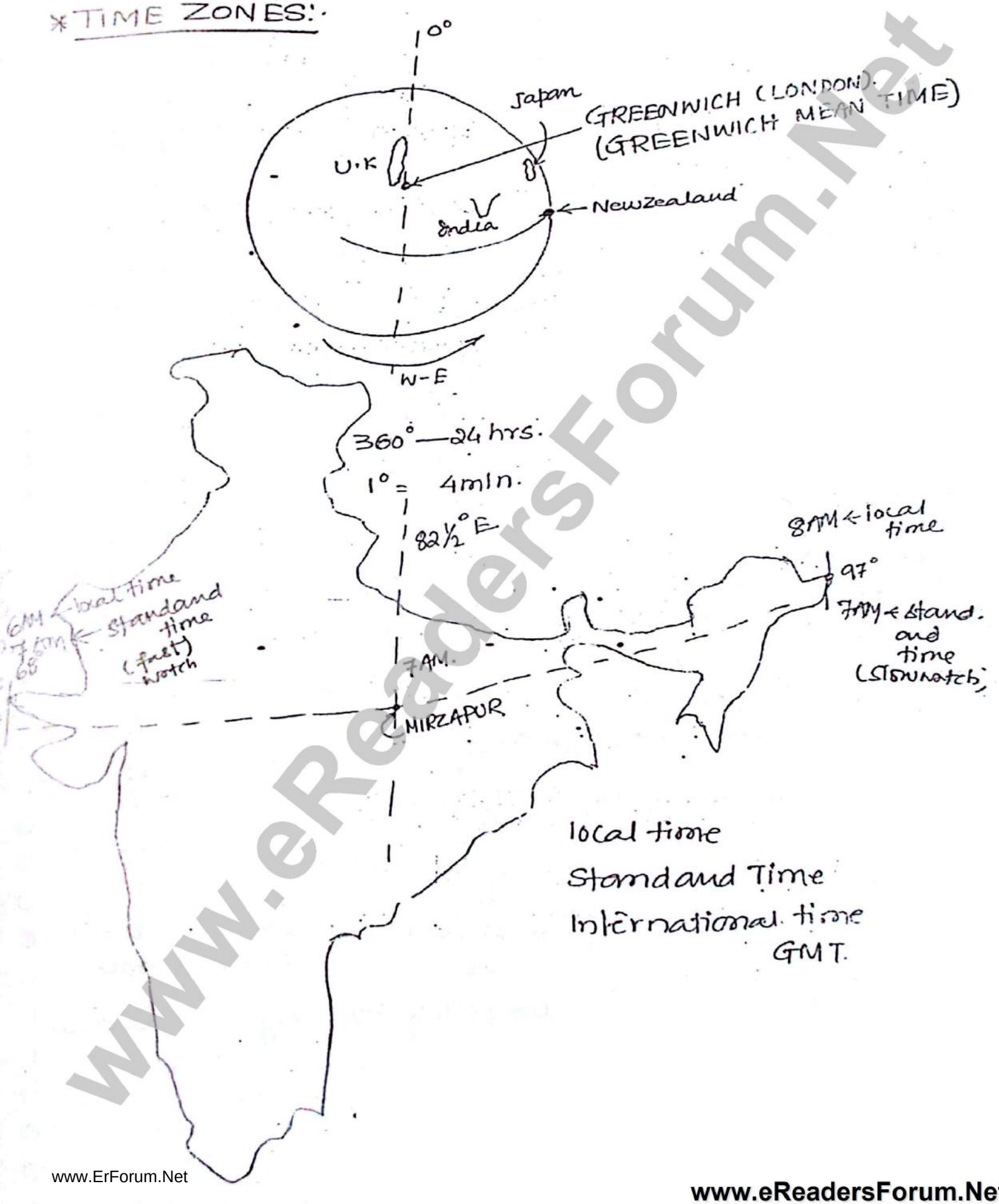
INDUSTRIES:· Page no 169–174.

*TIME ZONES:·



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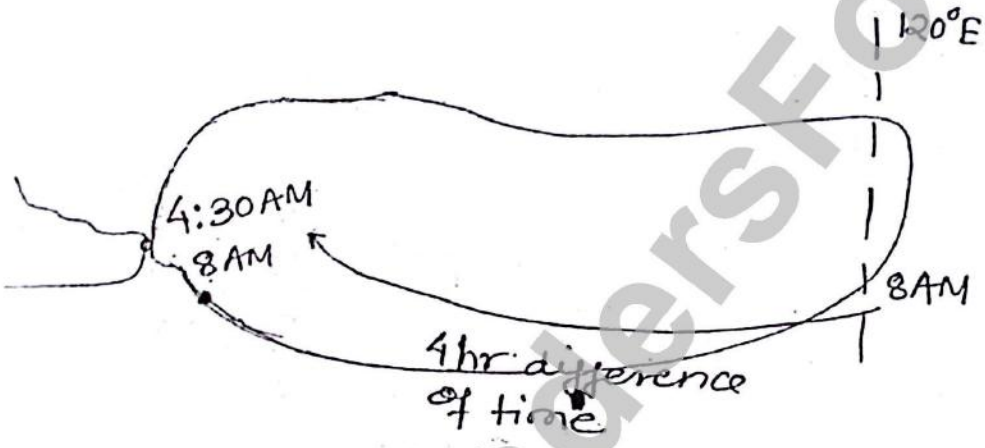
*If county is wider, then they have to adopt more no. of Time zones.

*9 time zones are present in RUSSIA.

CHINA :-

*3 times bigger than India, but only adopted 1 time zone ie 120°E (near Beijing).



Max^m time difference between the sketch of Any County.

* 180°E = 180°W ← called as INTERNATIONAL DATE LINE.

⇓

ZIGZAG LINE.

⇓

If straight line → Island will come across.

⇓

Completely running on oceans.

0°

2. 12 noon GMT. ⟶ 120° 8 PM.

0°W

12 noon (UK) ⟶ 120°E 8 PM

←

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INDIA → 2:30 hrs diff. CHINA

10 AM → 12:30 PM

(82½°E) 120°E

* First convert to GMT.

10 AM

← 4:30 AM (-5:30 hrs) 12:30 PM

+8 hrs

* India (82½°E)

10 AM 0° 10 AM

Sunday ← 4:30 AM

(8:30 PM Saturday) Sunday

120°W

120°W = ?

Note!.

* Pakistan following 75°E (+5 hrs). 30 min lack
* B'desh (+6 hrs. 30 min ahead.
* Nepal (+5:45 hrs) 15 min ahead.
* Srilanka (+5:30 hrs) same
* china (+8 hrs) (+2:30 ahead).
* Japan 135°E (+9 hrs) (+3:30 ahead)

* N Zealand following 180°.

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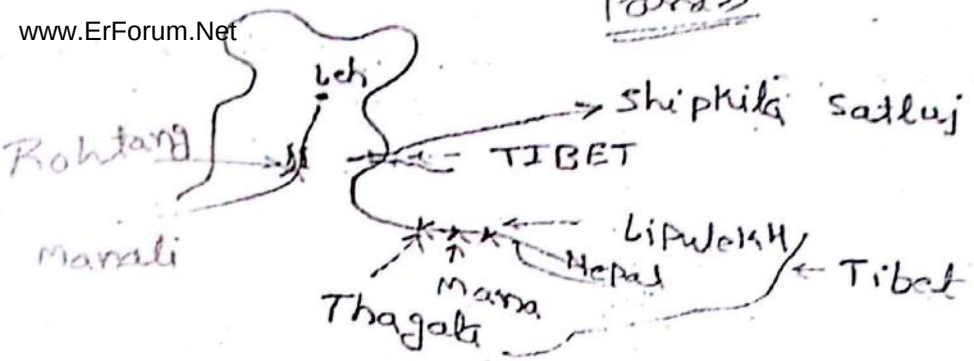
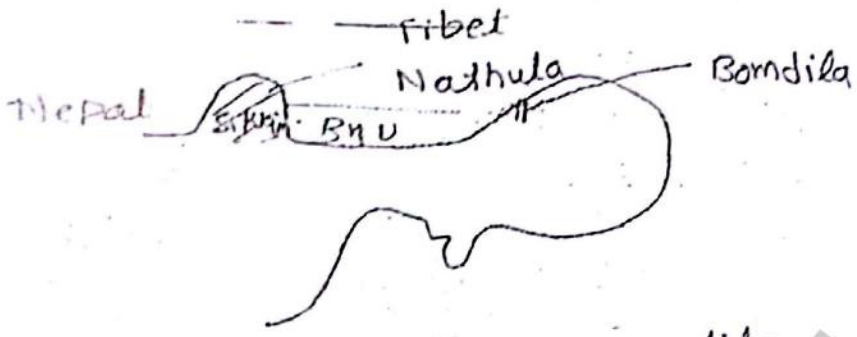
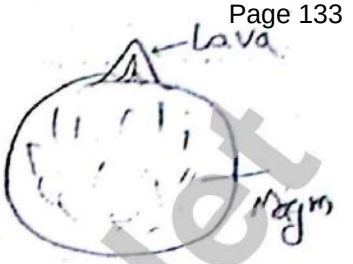
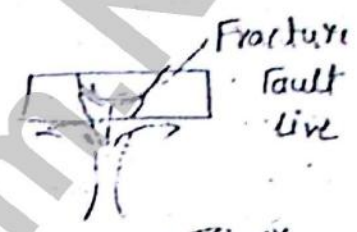
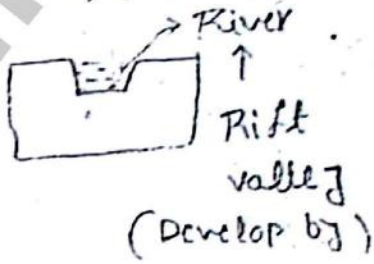
Passes







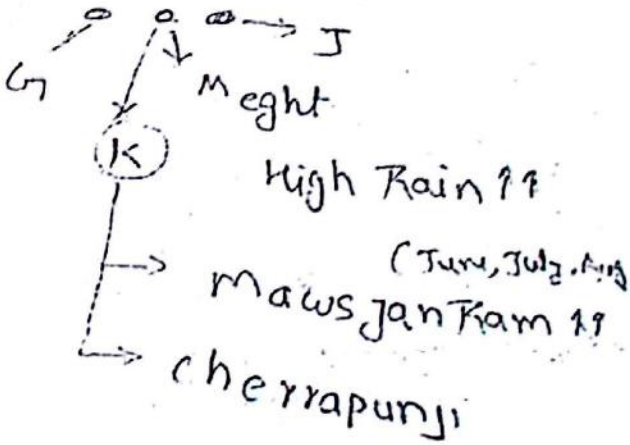


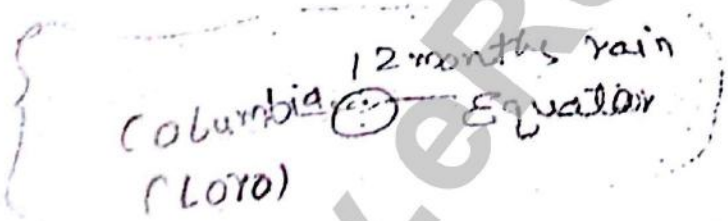


Magnetite

Basalt lava
Rock

Meghalaya plateau





Assam → Mikirhillsalso called Karbi Anglong

- Coral Polyp
- ⊙ Lime stone Rock
- Coral Reef

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Lakes

- Chilka → Saline coast lake : ORISSA (largest)
- Pulicat lake → AP-TN
- Vembanad (Kerala)

AGOON

→ Inland → Sambhar Lake (Jaipur)

→ Wular (largest freshwater lake) (J & K)

→ DAL Lake (J & K)

→ Loktak - Manipur

→ Kolleru lake - A.P

→ Sukhna - Chandigarh

→ Hussain Sagar Lake - Hyd. Sec

Tarn (Hills)

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